

FFT ANALYZER, CF-900 SERIES

MINI FFT ANALYSIS SYSTEM CF-920

DUAL CHANNEL FFT ANALYZER CF-910

SHORT FORM OPERATION

ONO SOKKI Co., Ltd.

Tokyo, Japan

PREFACE

We thank you for purchase of ONO SOKKI's CF-910/920
FFT Analyzer.

This SHORT FORM OPERATION is a simplified manual for operation
of analyzer, and you are requested to refer to the separate
operation Manual for further details of your model and also GB-IB.

Please note that this booklet does not include the description
of the functional differences among CF-910 and CF-920 and
their optional equipments.

See the separate Operation Manuals of the optional equipments
for how to use them.

C O N T E N T S

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- (2) Description of soft keys
- (3) Short form operation 1
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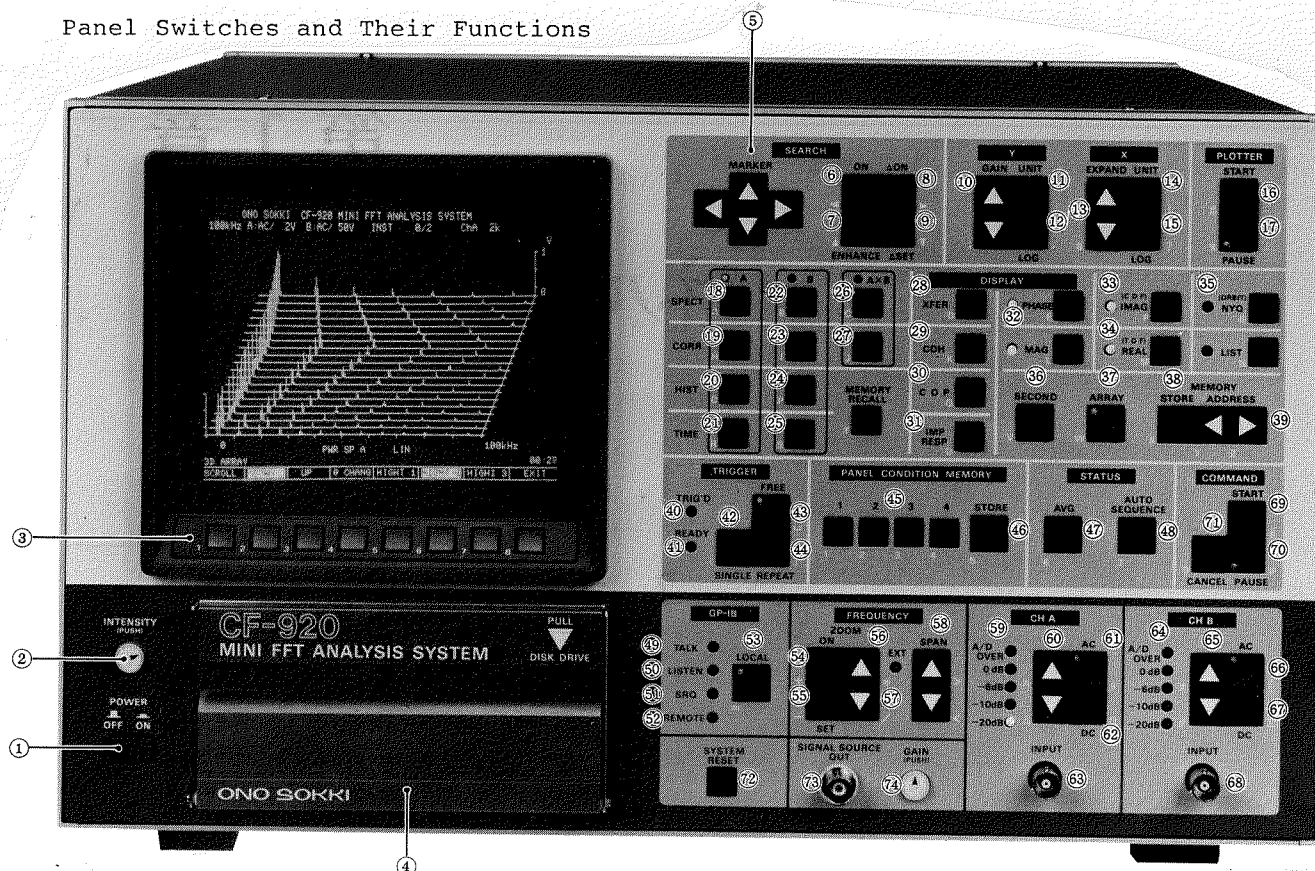
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CHAPTER 1

Panel Switches and Display

1. Panel switches and their functions
2. Display

Panel Switches and Their Functions



① Power switch

② CRT intensity control

③ Soft key

④ Micro floppy disk

SEARCH

- ⑤ Search cursor shift, for trigger setting, signal output setting, sweep range setting and coherent blank setting
- ⑥ Search ON/OFF
- ⑦ Search enhance ON/OFF
- ⑧ Delta ON/OFF
- ⑨ Delta cursor setting, Signal output frequency setting, Sweep range setting

Y UNIT

- ⑩ Y-coordinate gain control
- ⑪ rms, EU ON/OFF
- ⑫ Y-coordinate LOG/LIN selector

X UNIT

- ⑬ Time waveform expansion
- ⑭ CPM, ORD indication ON/OFF
- ⑮ X-coordinate LIN/LOG selector

PLOTTER

- ⑯ Plotter start
- ⑰ Plotter stop

DISPLAY

- ⑱ Ch.A spectrum display switch
- ⑲ Ch.A autocorrelation function display switch
- ⑳ Ch.A histogram display switch
- ㉑ Ch.A time waveform display switch
- ㉒ Ch.B spectrum display switch
- ㉓ Ch.B autocorrelation function display switch
- ㉔ Ch.B histogram display switch
- ㉕ Ch.B time waveform display switch
- ㉖ Cross spectrum display switch
- ㉗ Cross correlation function display switch
- ㉘ Transfer function display switch
- ㉙ Coherence function display switch
- ㉚ Coherence output power display switch
- ㉛ Impulse response display switch
- ㉜ Phase display switch *
- ㉝ Imaginary number display switch *
- ㉞ Real number display switch *

- ③⑤ Polar coordinates display switch
- ③⑥ Second display switch
- ③⑦ 3-array display switch
- ③⑧ CRT block memory store switch
- ③⑨ CTR block memory address switch

TRIGGER

- ④① Trigger indicator
- ④② Trigger ready indicator switch
- ④③ Single trigger switch
- ④④ Trigger free switch
- ④⑤ Repeat trigger switch

PANEL CONDITION MEMORY

- ④⑥ Memory address switch
- ④⑦ Store switch

STATUS

- ④⑧ Average switch
- ④⑨ Auto sequence ON/OFF switch

GP-IB

- ④⑩ Talk mode indicator
- ④⑪ Listen mode indicator
- ④⑫ Service request indicator

- ⑤② Remote mode indicator
- ⑤③ Local switch
- ⑤④ Real-time zoom ON/OFF switch
- ⑤⑤ Center frequency set switch
- ⑤⑥ Extension control switch
- ⑤⑦ External sampling clock indicator
- ⑤⑧ Frequency range selector switch

CH A

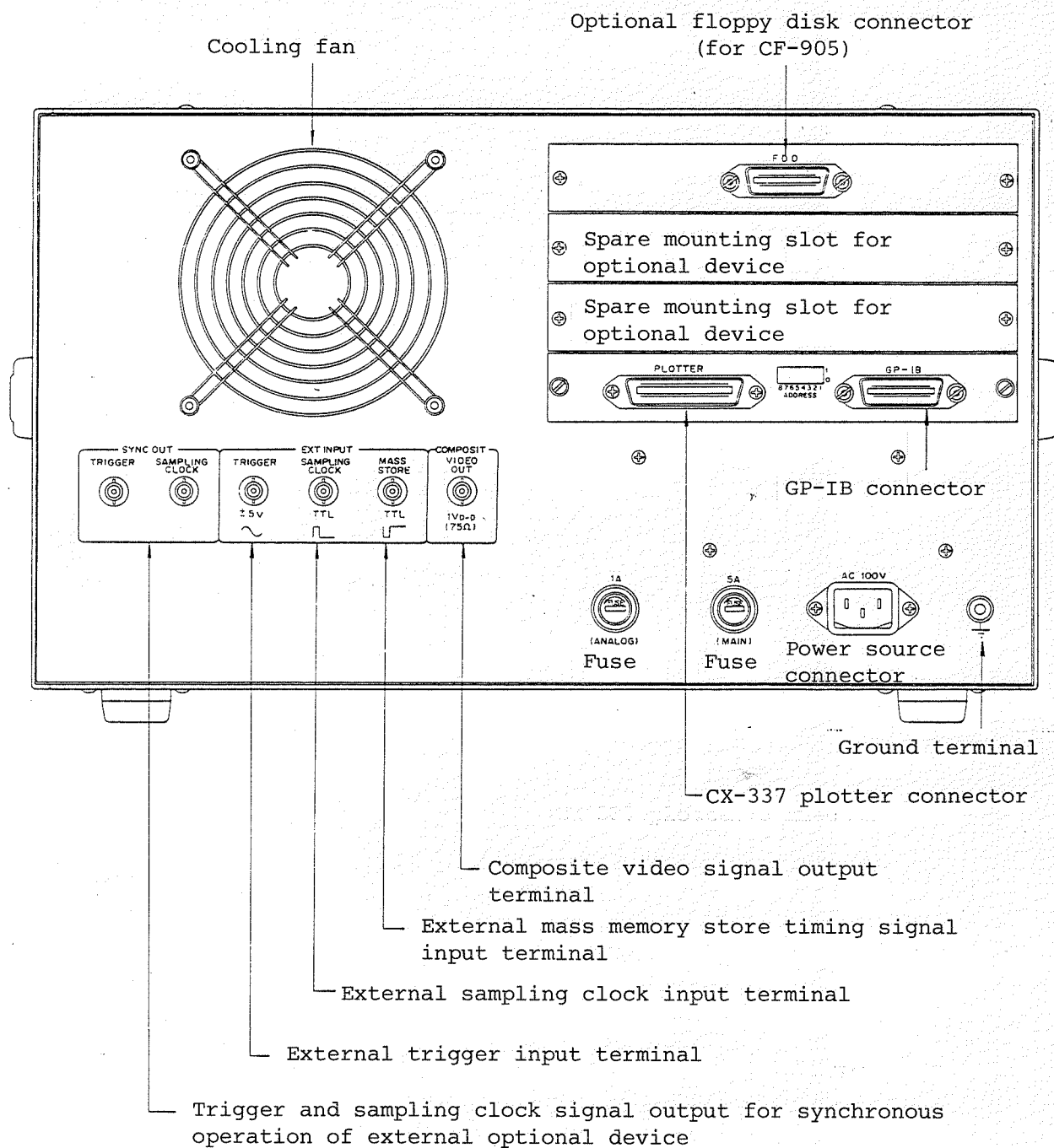
- ⑤⑨ Input level indicator
- ⑤⑩ Input voltage control switch
- ⑤⑪ AC coupling switch
- ⑤⑫ DC coupling switch
- ⑤⑬ Ch.A signal input connector

CH B

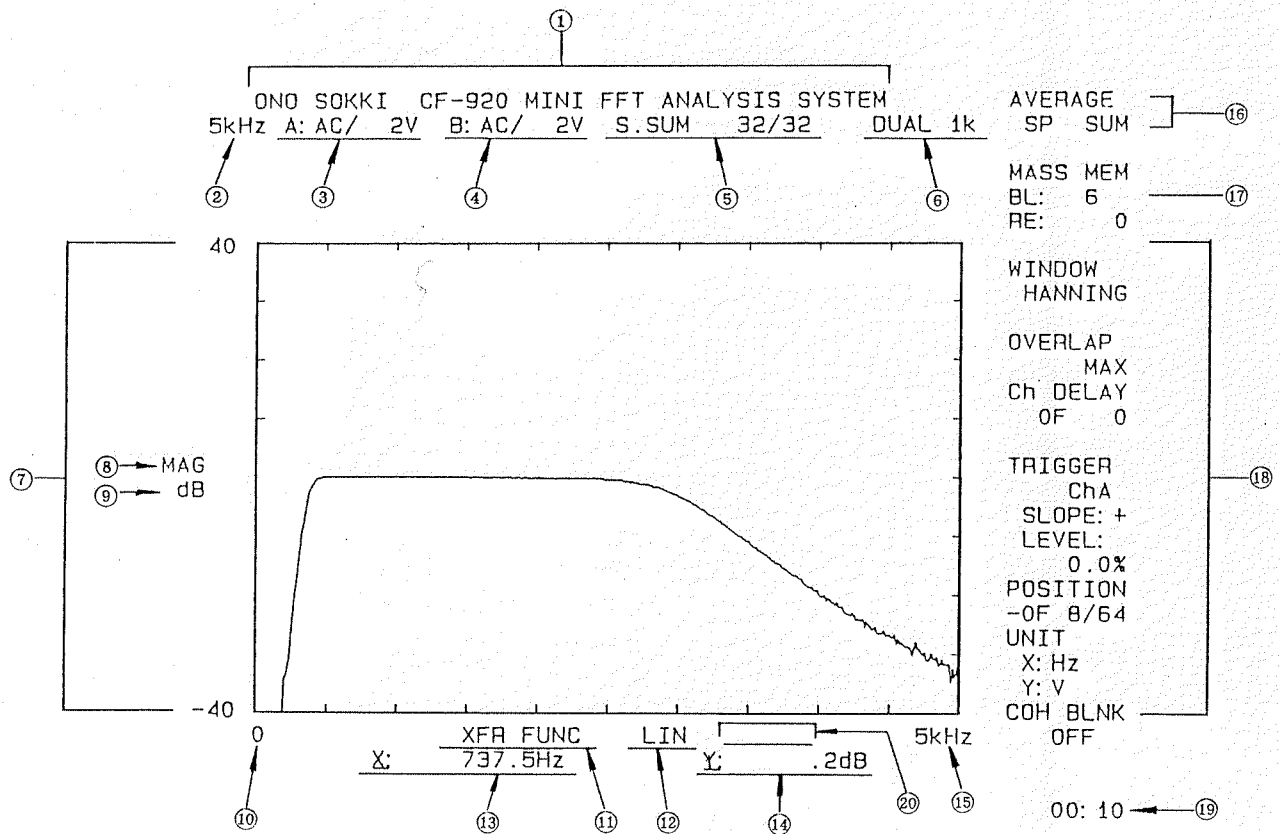
- ⑤⑭ Input level indicator
- ⑤⑮ Input voltage control switch
- ⑤⑯ AC coupling switch
- ⑤⑰ DC coupling switch
- ⑤⑱ Ch.B signal input connector

COMMAND

- ⑥⑨ Start switch
- ⑥⑩ Pause switch (Continue switch)
- ⑥⑪ Cancell switch
- ⑥⑫ System reset switch
- ⑥⑬ Signal output switch
- ⑥⑭ Signal output level control



DISPLAY SECTION



DISPLAY SECTION	DISPLAY PATTERN	DESCRIPTIONS	Instruction Manual page
① Label		Disk file identification index	3-138
② Frequency range Inverse for external sampling	* Hz	* 1 - 40k (CF-910) 1 - 100k (CF-920)	2-6
③ AC or DC coupling	AC	AC coupling DC cancelled with inverse	
④ Voltage range for (3) (by channel)	DC * V	DC coupling indication *: 1m - 50m (only AC), 0.1 - 50	
⑤ Kinds and number of averages When an average number is inverse, display is inhibited.	S.SUM */** S.EXP */** S.PEK */** S.SWP */** T.SUM */** T.EXP */** T.ABS */** T.SUM */**	Normalizing average (*=2-8192) Exponential average (*=2-16) Peak hold (infite) Sweep average (spectrum) Time coordinate normalizing average (*=2-8192) Time coordinate exponential average (*=2-16) Time coordinate absolute value average (*=2-8192) Histogram normalizing average (*=2-8192)	3-70 3-13 3-31
⑥ Data length display Inverse display is given while record memory is being reproduced.	DUAL 1K Ch A 2K Ch B 2K DUAL 5K	Uses Ch.A and Ch.B, 1,024 points Uses Ch.A, 2,048 points Uses Ch.B, 2,048 points Uses Ch.A and Ch.B 512 points	3-27
⑦ Y-coordinates span indication			
⑧ Nature of waveform	MAG PHASE	Magnitude Phase	

DISPLAY SECTION	DISPLAY PATTERN	DESCRIPTIONS	Instruction Manual page
	REAL IMAG PDF CDF M *	Real number, Level (Time) Imaginary number Probability density function Probability density distribution CRT block memory indication (*=1-30)	
⑨ Y-coordinate unit	dBV dBEU dBVr V EU Vr	Valid when Y UNIT switch is "on" Valid when Y UNIT switch is "on"	3-149
⑩ X-coordinate start point	0 ***** sec * V BN *	0Hz=DC (with DC coupling) With time waveform display With time waveform extended With correlation function With PDF or CDF (*= $\pm 1m-50m$, $\pm 0.1-50$) With octave (*=-2 - 36)	
⑪ Name of functions	TIME* PWR SP* SPECT* CRS SPEC XFR FUNC COH COP IMP RESP CORR* CRS CORR HIST* *OCT CEPST*	Time waveform (*=A, B=channel) Spectrum (*=A, B=channel) Fourier spectrum (*=A, B=channel) Cross spectrum Transfer function Coherent function Coherent output power Impulse response Autocorrelation function (*=A, B=channel) Cross correlation function Histogram (*=A, B=channel) Octave spectrum (*=1/1, 1/3) Cepstrum (*=A, B=channel)	
⑫ X-coordinate scale	LIN LOG Ex n X N	Linear display Logarithmic display Extended time coordinate (n=2-16) Frequency zoom (N=2-256)	
⑬ X-coordinate readout value	SEC Hz CPM ORD *** [***] Hz	Valid when X-coordinate UNIT switch is "on". - " - (degree) Number of samples of PDF or CDF With OCT ([***]=2-50)	
⑭ Y-coordinate readout value Note: P-when partial O.A. is valid.	V, PV Vr, PVr dBV, PdBV dBr, PdBr dBEU, PdBEU	Valid when Y-coordinate UNIT switch is "on". Valid when Y-coordinate UNIT switch is "on". - " -	
⑮ X-coordinate end point	*sec *Hz *** BN*	Time length of one frame (a length of data: $\pm 1/f$ max.) As arbitrarily extended Upper limit of frequency span (*=1-100K) As arbitrarily zoomed Number of samples with PDF or CDF Number of bands with OCT	
⑯ Status of averaging		Inverse display when disk is used for analysis source	

DISPLAY SECTION	DISPLAY PATTERN	DESCRIPTIONS	Instruction Manual page
①7 CRT block memory and time record memory	BL:** RE:*****	Already memorized in inverse (*=1-30) Already memorized except "0"	3-172 3-147
①8 View function		6 functions	2-84
①9 Time, Timer	**:** **:**	Time elapsed after reset, Arbitrarily set time, Interval time (goes "on" with inverse.)	
②0 Function	ADD DEF MULT DIV	Addition Subtraction Multiplication Division	3-23 3-34 3-111

CHAPTER 2

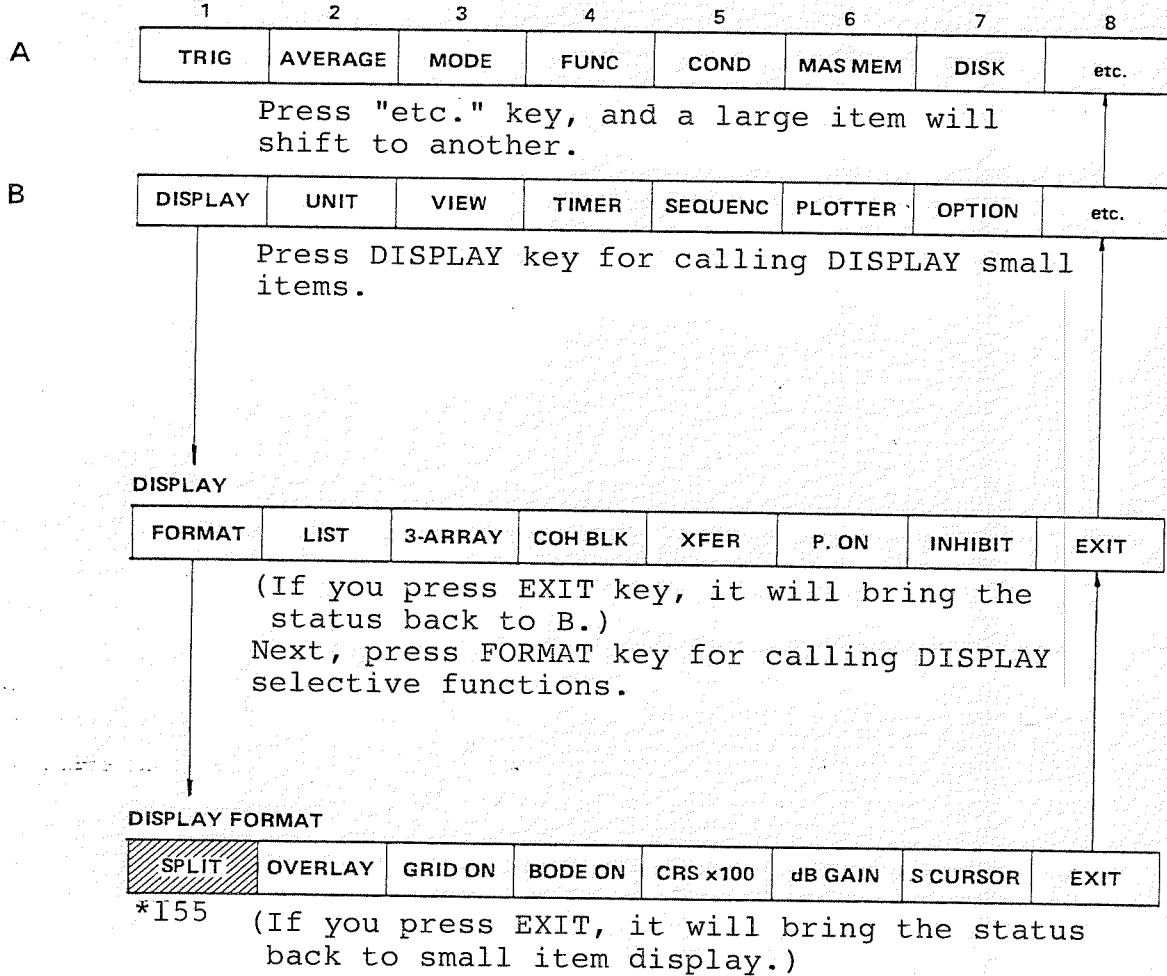
DESCRIPTION OF SOFT KEYS

1. Description of soft keys
2. TRIGGER key
3. AVERAGE key
4. MODE key
5. FUNCTION key
6. CONDITION key
7. MASS MEMORY key
8. DISK key
9. DISPLAY key
10. UNIT key
11. VIEW key
12. TIMER key
13. SEQUENCE key
14. PLOTTER key

DESCRIPTION OF SOFT KEYS

The soft keys are those 8 keys arranged under the CRT display panel and work for calling large items, small items and selective functions.

Large items and small items



When a key in the position of SPLIT in the above example is inverse, it tells you that the key has been "on".

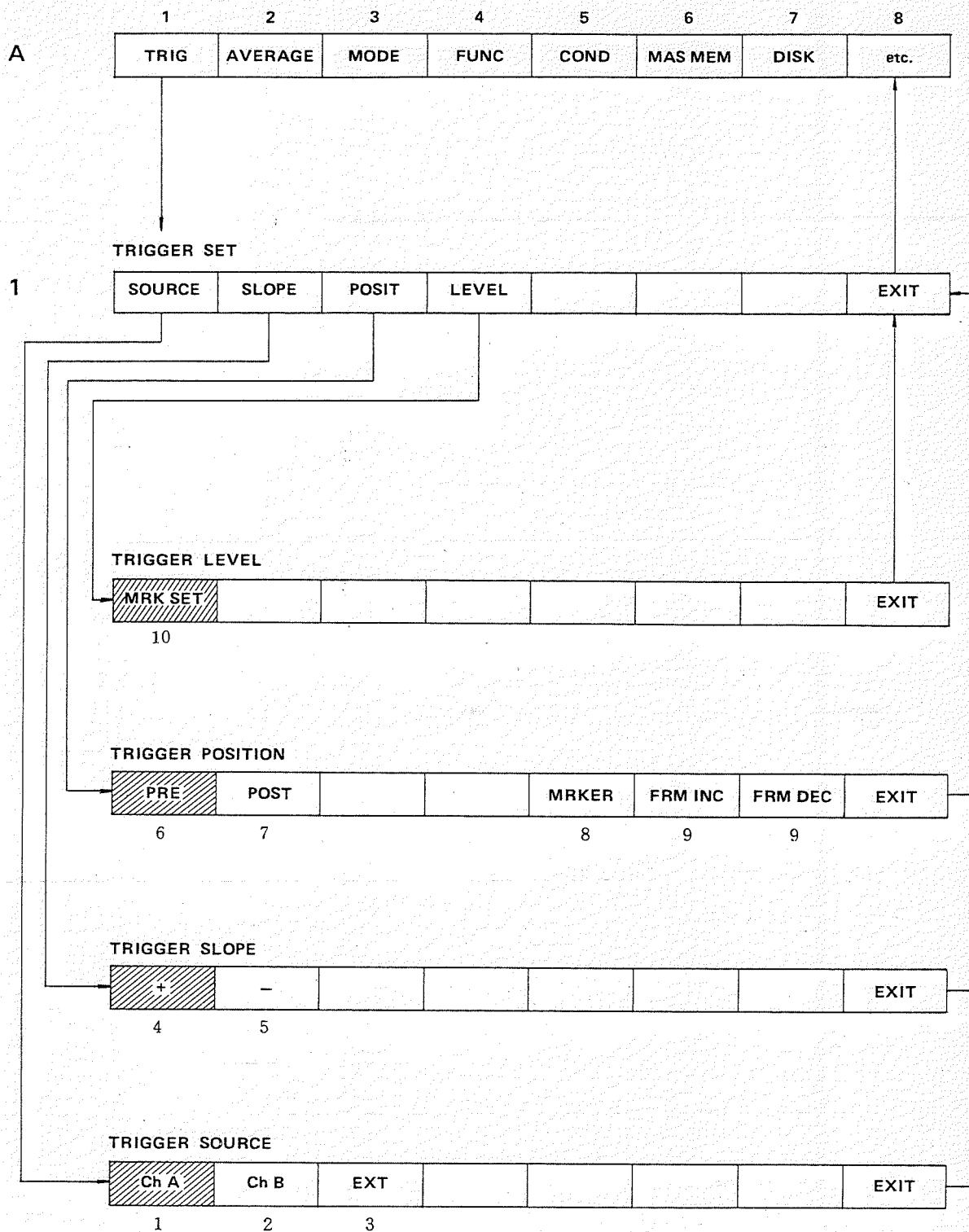
(If the key is inverse, the key is "off".)

Press a key for inverse, and the key will go "on".

* The numbers put on each soft key corresponds to the numbers used in Short Form Operation 2 (p. 3-6)

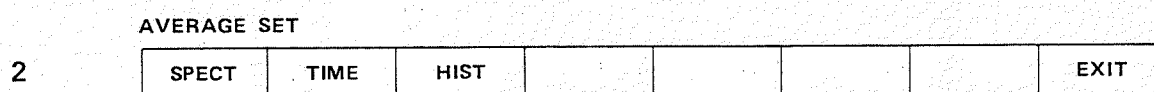
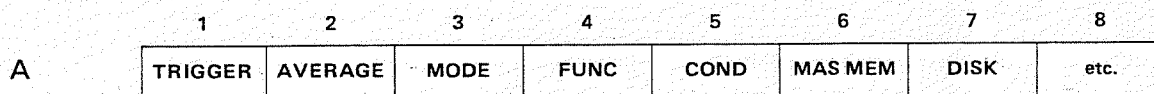
DISPLAY FORMAT

TRIGGER



DISPLAY FORMAT

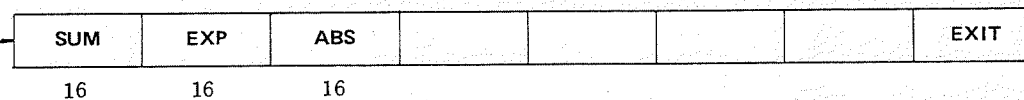
AVERAGE



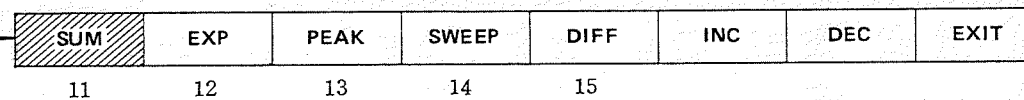
HIST AVERAGE



TIME AVERAGE

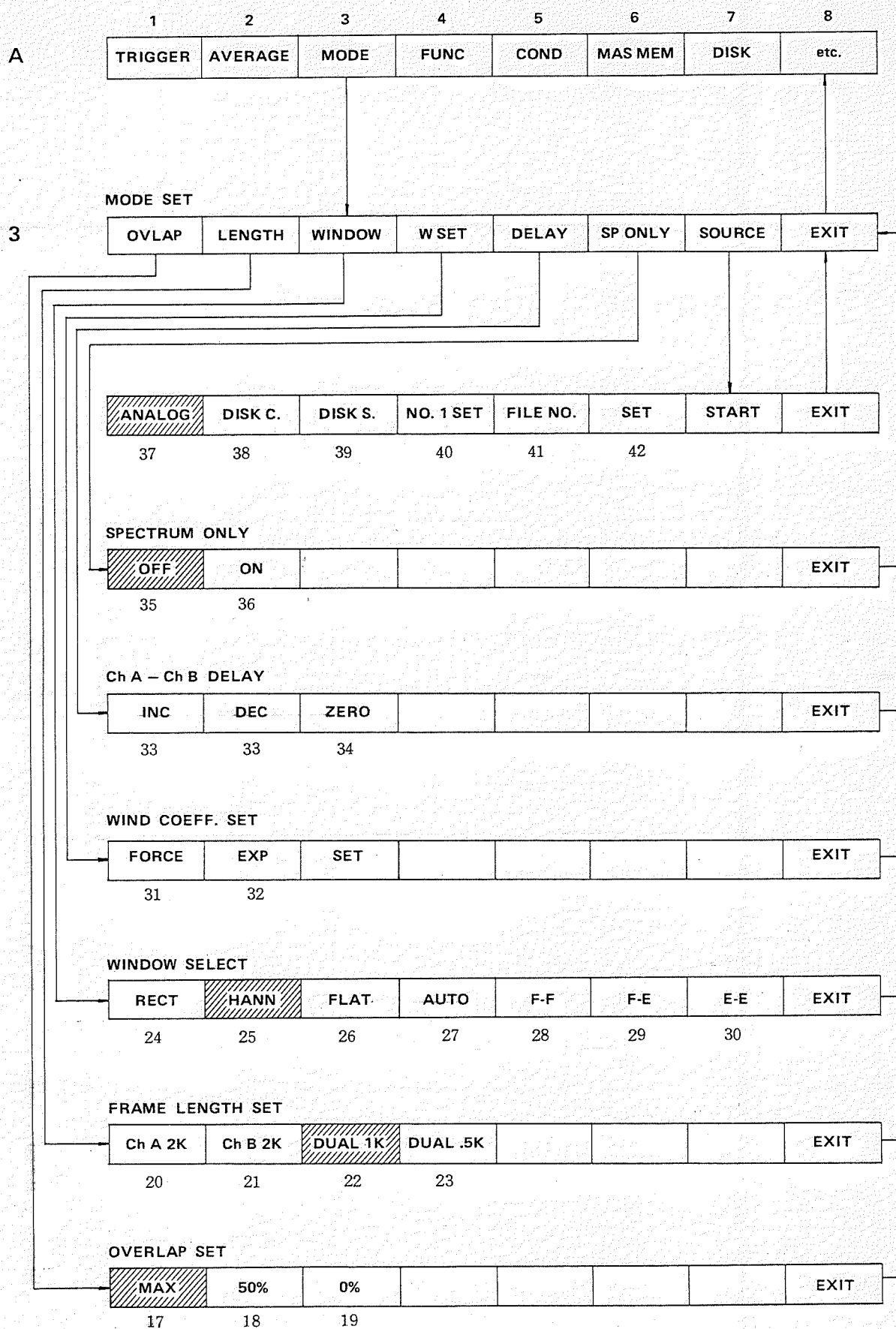


SPECTRUM AVERAGE



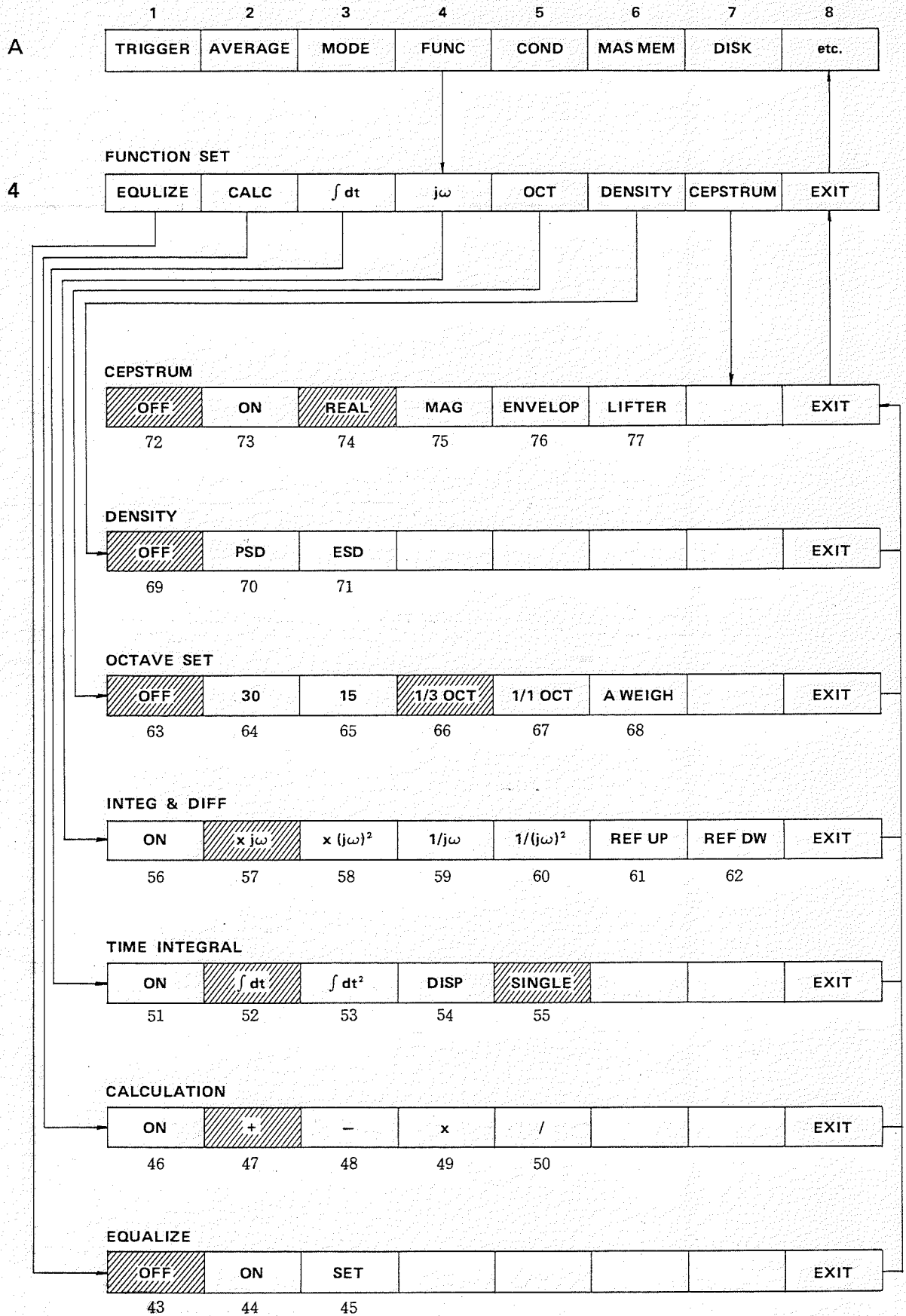
DISPALY FORMAT

ANALYSIS MODE



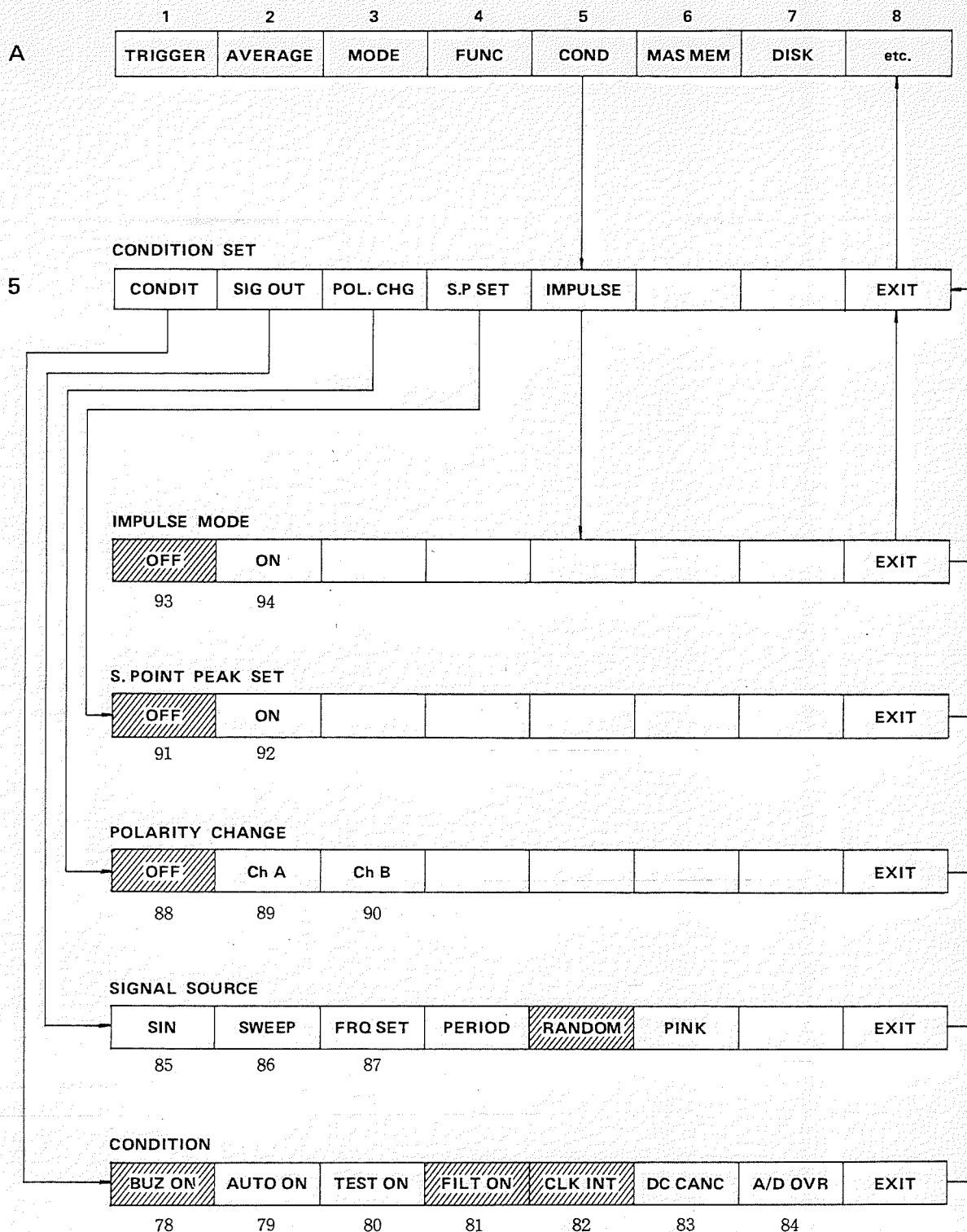
DISPALY FORMAT

OPERATIONAL FUNCTION



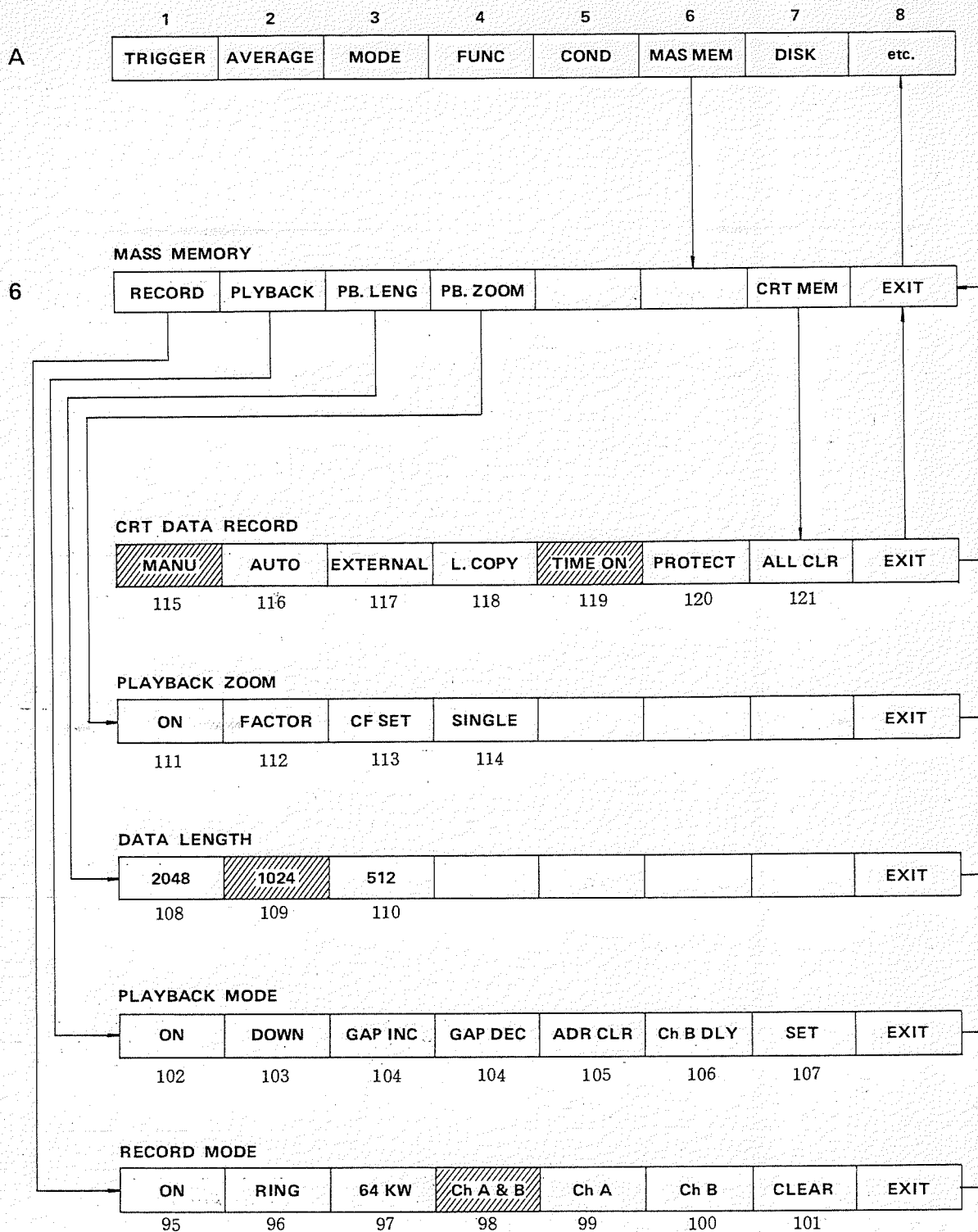
DISPALAY FORMAT

CONDITION



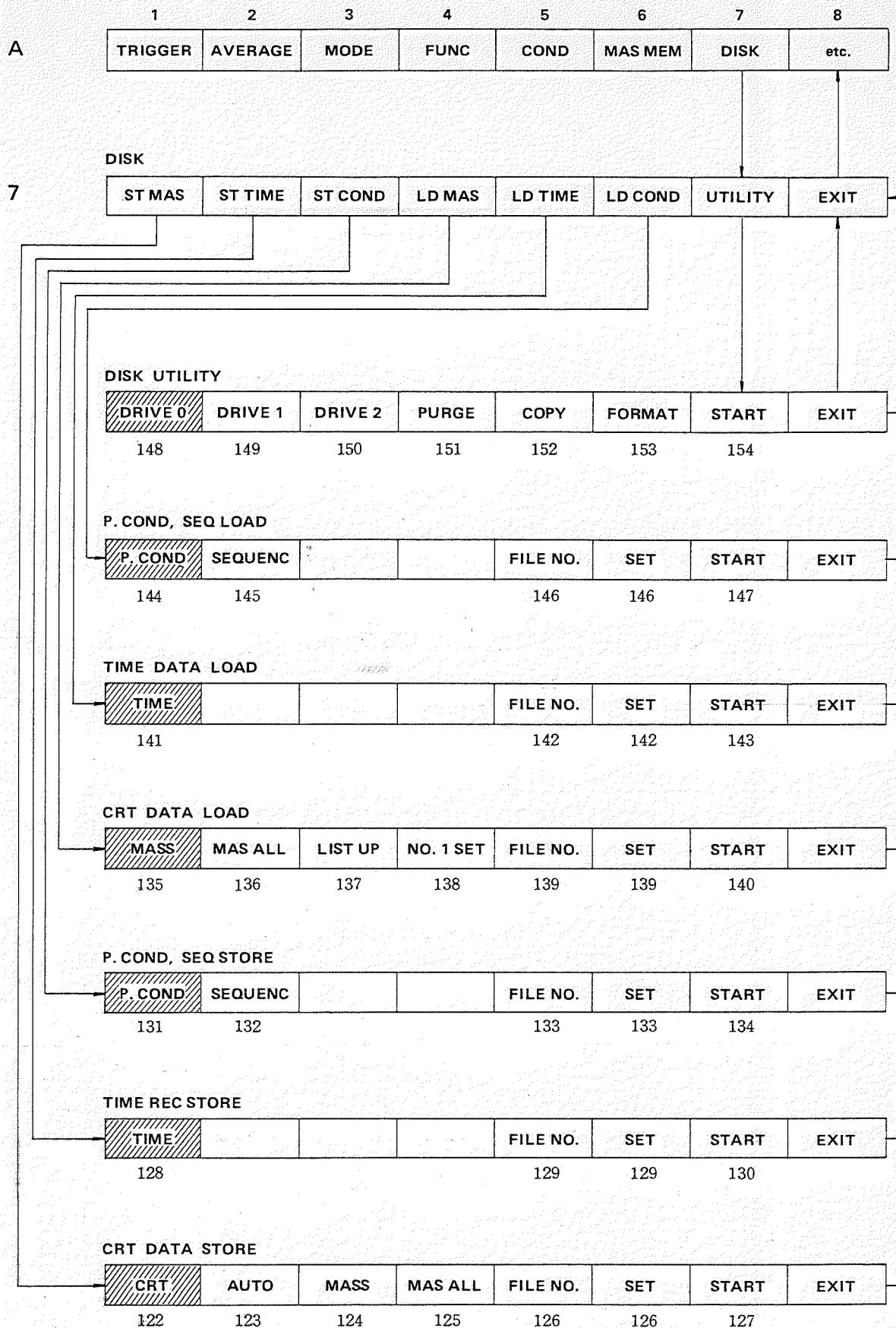
DISPLAY FORMAT

MASS MEMORY



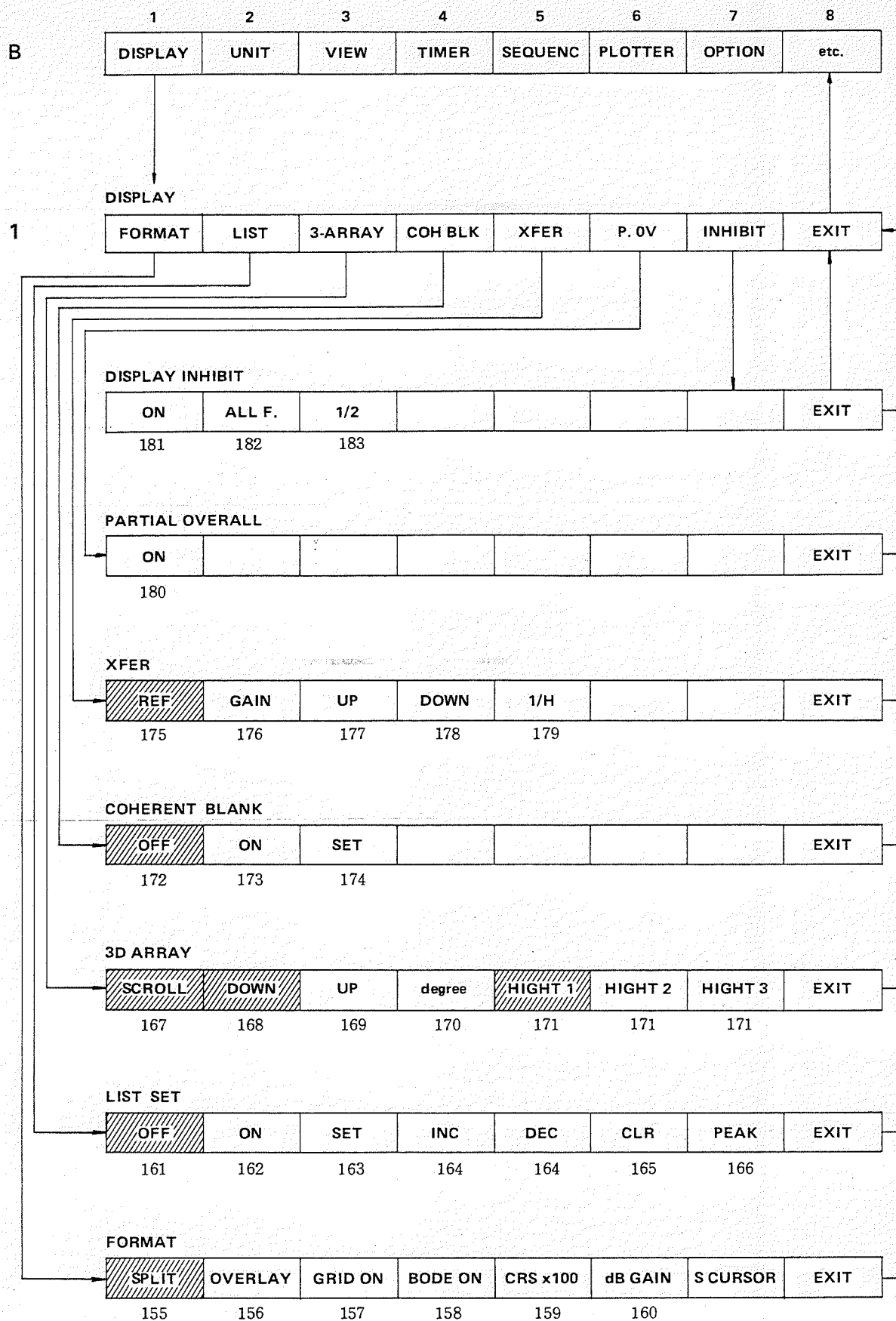
DISPLAY FORMAT

FLOPPY DISK



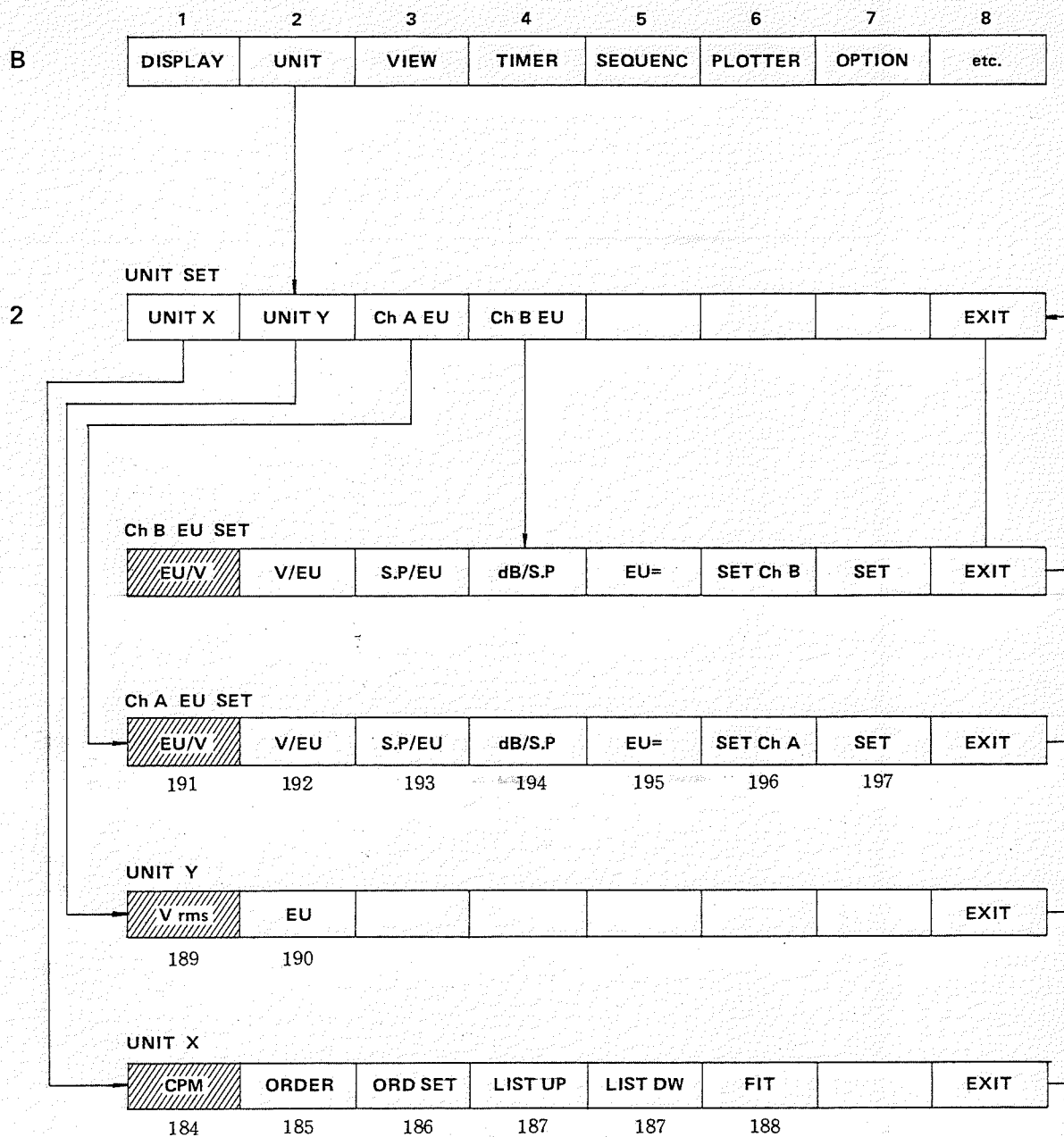
DISPLAY FORMAT

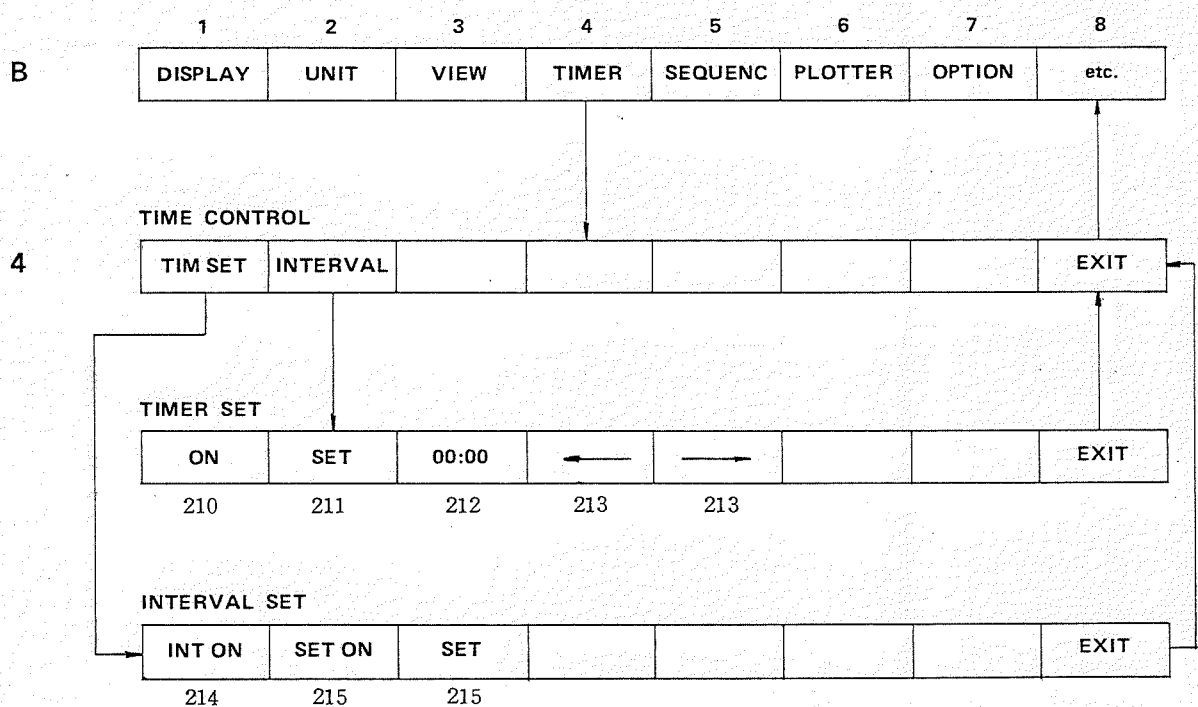
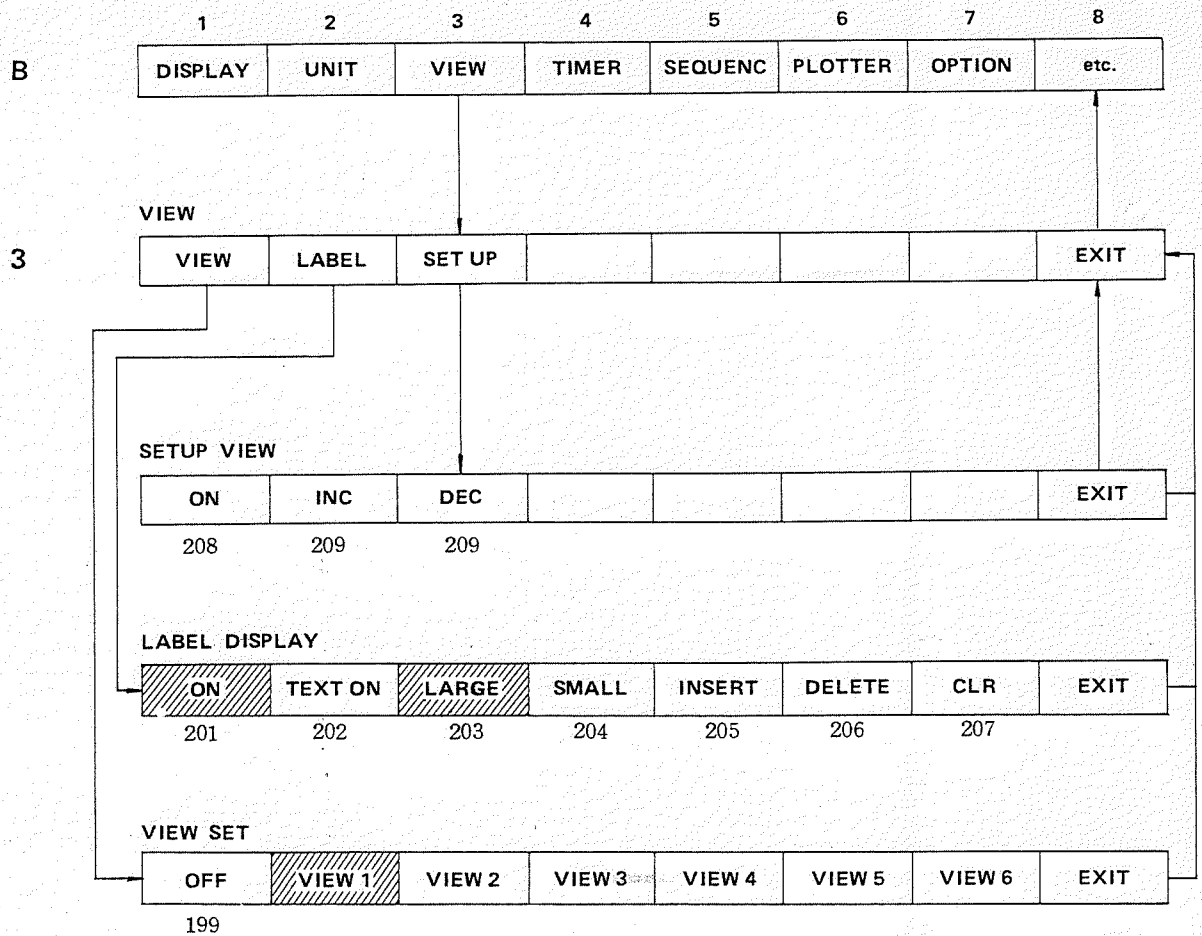
DISPLAY CONTROL



DISPLAY FORMAT

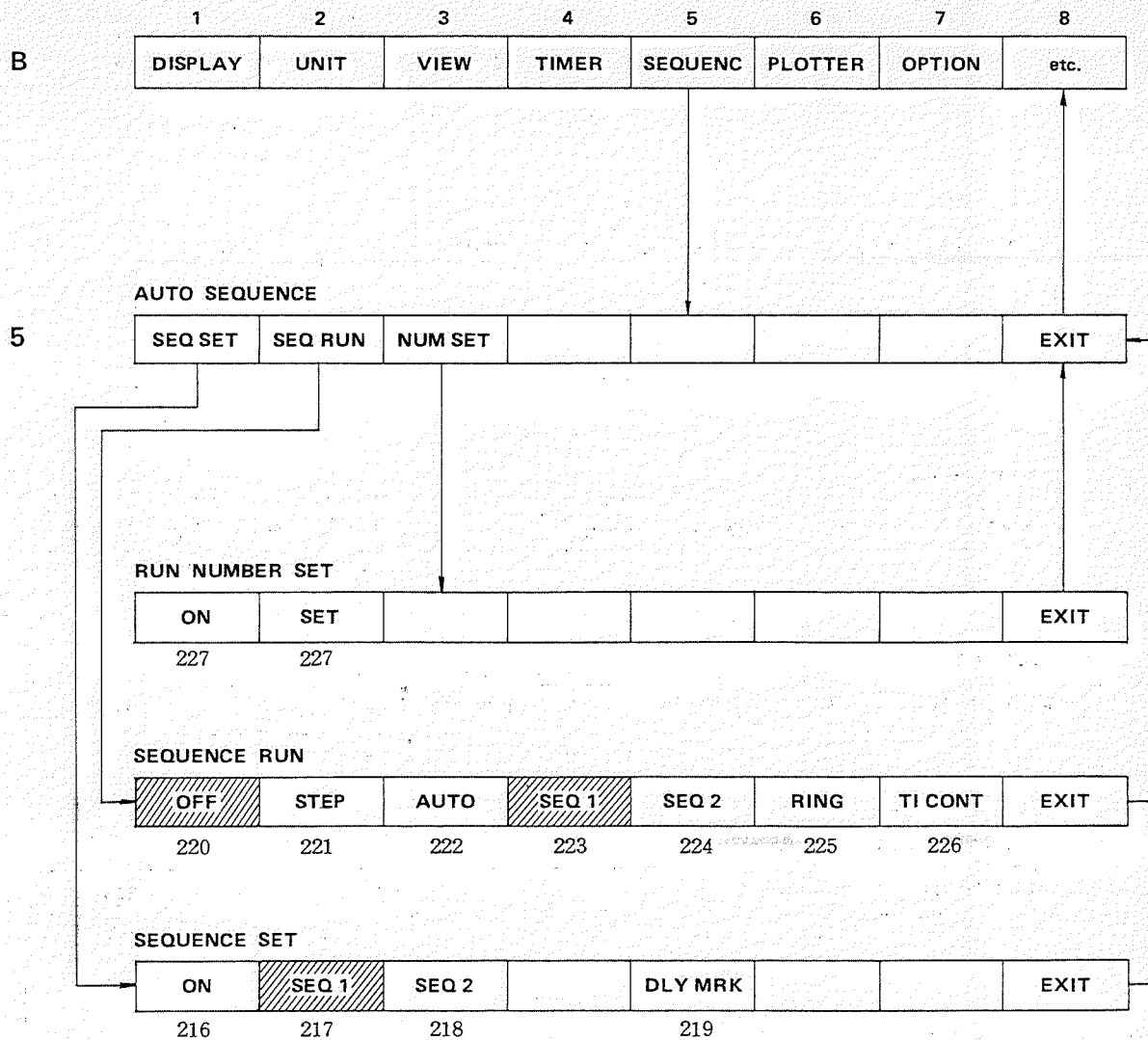
DISPLAY UNIT





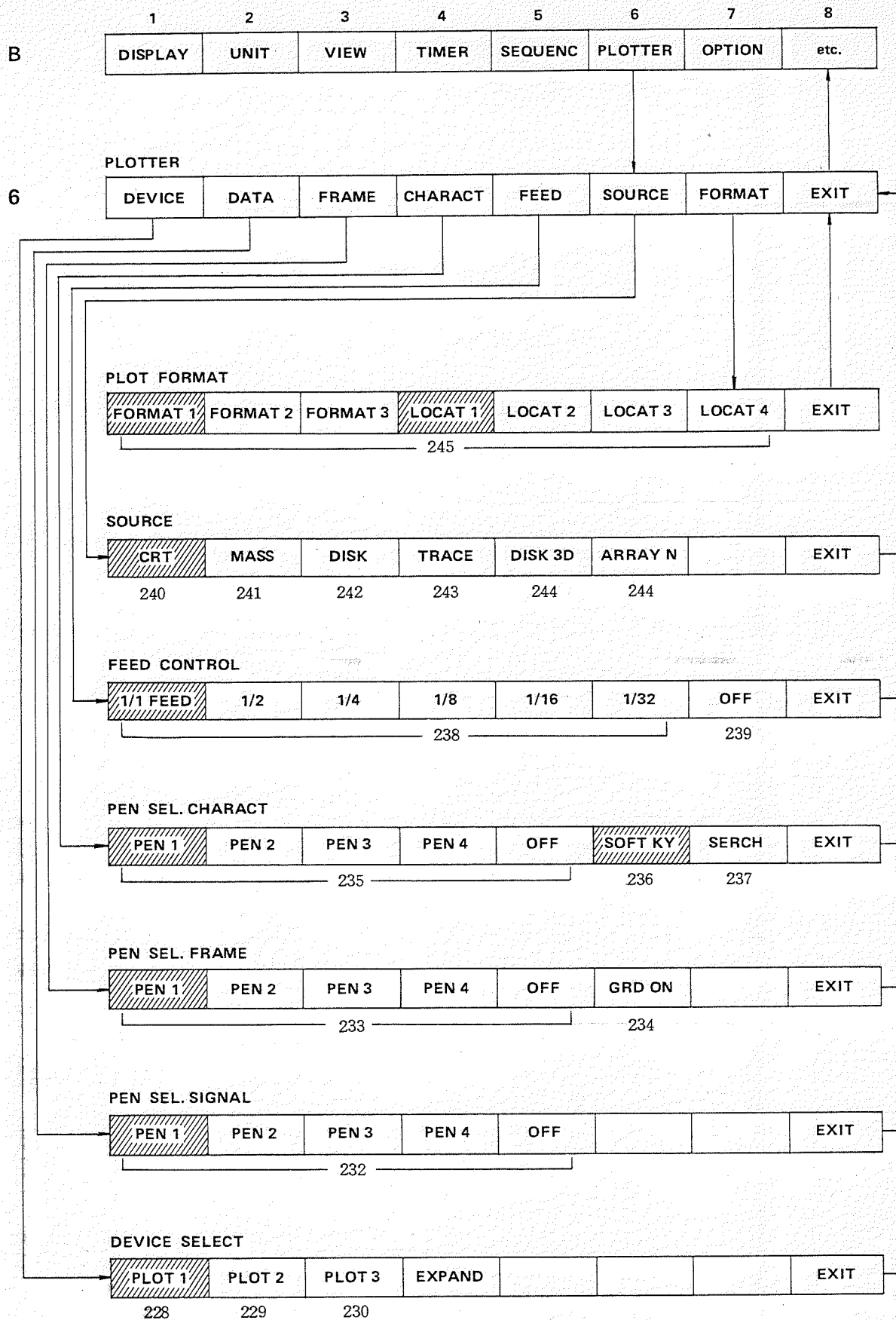
DISPALY FORMAT

AUTO SEQUENCE



DISPLAY FORMAT

PLOTTER CONTROL



CHAPTER 3

SHORT FORM OPERATION

1. Panel Switch Short Form
2. Soft Key Short Form

SHORT FORM OPERATION

1. Short form operation 1

Short Form Operation 1 covers the fundamental operation of the analyzer using mainly its panel switches.

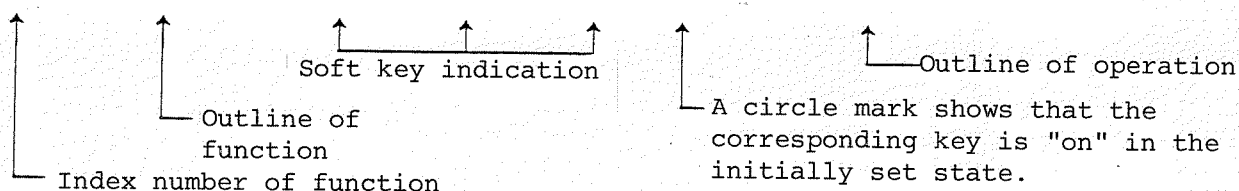
2. See Short Form Operation 2 for further details.

2. Short form operation 2

Short Form Operation 2 covers the applied operation of the analyzer using mainly its soft keys and is compiled in the under-mentioned way. See Operation Manual for further details of each function.

Typical functions described in this paragraph.

Trigger. Average					
No	Function	Large item	Small item	Selective item	* Operation
8	Set a trigger position by search marker.	TRIG	POSIT	MARKER	Press REPEAT of SINGLE TRIGGER switch → Display a time waveform of the channel selected by No.1 to No.3 → Set a trigger position by search marker.
9	Change the trigger position in the unit of frame length.			FRM INC FRM DEC	
10	Change the trigger level.			LEVEL MRK SET	



(How to interpret the description of No.8)

1. Press TRIG of large item of the soft key.
2. Press POSIT of small item of the soft key.
3. Press MARKER of the selective item.
("Press key" in the description means to press the selective item keys in the order so specified.)
4. Actuate REPEAT or SINGLE trigger.
5. Display a TIME waveform of Ch.A or Ch.B.
6. Set a trigger position by shifting the search marker.

SHORT FORM OPERATION 1

PANEL SWITCH SECTION

No.	Function	Operation of panel switch	Refer to SHORT FORM 2
1	Changing frequency range	Press FREQUENCY SPAN switch.	No.83
2	Connecting AC input	Press Ch.A or Ch.B AC switch.	
3	Connecting DC input	Press Ch.A or Ch.B DC switch	
4	Changing input voltage range	Depress Ch.A or Ch.B ☐ or ☐ switch.	No.1 - No.10
5	Changing signal output level	Turn GAIN control knob (SIG OUT)	
6	Triggering	Press TRIGGER REPEAT or TRIGGER SINGLE.	
7	Displaying Ch.A power spectrum	Press DISPLAY SPECT A.	No.159
8	Displaying Ch.B power spectrum	Press DISPLAY SPECT B.	
9	Displaying cross spectrum	Press DISPLAY SPECT AxB.	
10	Displaying Ch.A power spectrum phase	① Press DISPLAY SPECT A. ② Press DISPLAY PHASE.	
11	Displaying real number of Ch.A Fourier spectrum.	① Press DISPLAY SPECT A. ② Press DISPLAY REAL.	
12	Displaying Ch.B Fourier spectrum real number	① Press DISPLAY SPECT B. ② Press DISPLAY REAL.	
13	Displaying Ch.A Fourier spectrum imaginary number	① Press DISPLAY SPECT A. ② Press DISPLAY IMAG.	
14	Displaying Ch.B Fourier spectrum imaginary number	① Press DISPLAY SPECT B. ② Press DISPLAY IMAG.	
15	Displaying Ch.A Fourier spectrum in Nyquist diagram	① Press DISPLAY SPECT A. ② Press DISPLAY REAL or IMAG. Press DISPLAY NYQ.	
16	Displaying Ch.B Fourier spectrum in Nyquist diagram	Press DISPLAY SPECT B. Press DISPLAY REAL or IMAG. Press DISPLAY NYQ.	
17	Displaying Ch.A autocorrelation function	Press DISPLAY CORR A.	
18	Displaying Ch.B autocorrelation function	Press DISPLAY CORR B.	
19	Displaying cross correlation function	Press DISPLAY CORR AxB.	
20	Displaying Ch.A PDF	Press DISPLAY HIST A.	
21	Displaying Ch.B PDF	Press DISPLAY HIST B.	
22	Displaying Ch.A CDF	① Press DISPLAY HIST A. ② Press DISPLAY IMAG.	No.155-156
23	Displaying Ch.B CDF	① Press DISPLAY HIST B. ② Press DISPLAY IMG.	
24	Displaying Ch.A time waveform	Press DISPLAY TIME A.	
25	Displaying Ch.B time waveform	Press DISPLAY TIME B.	
26	Displaying Ch.A time waveform in Lissajous figure	① Press DISPLAY TIME A ② Press DISPLAY SECOND ③ Press DISPLAY TIME B ④ Press DISPLAY NYQ	

No.	Function	Operation of panel switch	Refer to SHORT FORM 2
27	Splitting display	① Display data other than NYQ and LIST (lower portion) ② Press DISPLAY SECOND. ③ Display data other than NYQ and LIST (upper portion)	No.155 - 156
28	Changing an upper portion of splitted display	① Let CRT display a splitted image. ② Press DISPLAY SECOND ③ Call a desired waveform	
29	Displaying real number of Fourier spectrum on the lower portion and imaginary number on the upper portion of a splitted screen, or vice versa.	① Press DISPLAY SPECT A or B. ② Press DISPLAY REAL or IMAGE. ③ Press DISPLAY SECOND. ④ Press DISPLAY SPECT A or B. ⑤ Press DISPLAY SECOND. ⑥ Press DISPLAY IMAG or REAL.	
30	Displaying transfer function gain	Press DISPLAY XFER	No.175 - 179
31	Displaying transfer function phase	① Press DISPLAY XFER. ② Press DISPLAY PHASE.	
32	Displaying of transfer function gain on the lower portion and phase on the upper portion of splitted screen	① Press DISPLAY XFER ② Press DISPLAY SECOND ③ Press DISPLAY PHASE.	No.158
33	Displaying transfer function in Nyquist diagram	① Press DISPLAY XFER ② Press DISPLAY NYQ	
34	Displaying coherent function	Press DISPLAY COH	No.172 - 174
35	Displaying coherent output power	Press DISPLAY COP	
36	Displaying impulse response	Press DISPLAY IMP RESP	
37	Display LIST	→ Set soft key	No.161 - 166 No.185 - 188
38	Turning search "on"	Press SERCH ON	
39	Shifting a search marker	(1) Press marker ☐ or ☐ for shifting horizontally point to point (2) Press marker ☐ or ☐ for shifting horizontally by every 13 points	
40	Displaying delta cursor ↓	① Press SEARCH ON ② Press SEARCH Δ SET	
41	Bringing delta cursor to zero point	Following the preceding procedure, press SEARCH Δ ON	
42	Turning delta cursor "off"	① Release SEARCH ON ② Press SEARCH Δ SET	
43	Performing search enhance	(1) Press SEARCH ENHANCE (2) ① Search spectrum to be enhanced ② Press ENHANCE	
44	Increasing Y-coordinates gain	(1) If it is spectrum: Press Y UNIT GAIN (2) If it is PDF, etc.: ① Release Y UNIT LOG ② Press Y UNIT GAIN	
45	Taking Y-coordinates as V rms, EU, etc.	Turn "on" Y UNIT UNIT	No.189 - 198
46	Taking Y-coordinates as LOG	Turn "on" Y UNIT LOG	

No.	Function	Operation of panel switch	Refer to SHORT FORM 2
47	Taking Y-coordinates as LIN	Turn "off" Y UNIT LOG	No.185 - 188
48	Extending X-coordinates (time coordinates)	(1) Press X UNIT EXPAND (2) ① Press SEARCH ON ② Move cursor to a desired point ③ Press X UNIT EXPAND	
49	Taking X-coordinates as CPM or ORD	Turn "on" X UNIT UNIT (Soft key must be set for ORD.)	
50	Taking X-coordinates as LIN	Turn "off" X UNIT LOG Turn "on" X UNIT LOG	
51	Displaying 3-array diagram	① Display a waveform other than LIST and NYQ ② Press DISPLAY ARRAY	No.167 - 171
52	Storing a waveform in CRT block memory	① Display a waveform other than LIST and NYQ ② Press DISPLAY MEMEORY STORE	No.115 - 121 No.122 - 127
53	Calling a stored waveform	① Address an inverse display using DISPLAY MEMORY ADDRESS switch (Indicated on the right hand of CRT) ② Press DISPLAY MEMORY RECALL	No.135 - 140
54	Displaying a stored waveform in 3-array diagram	① Following the preceding procedure, press DISPLAY ARRAY ② Press COMMAND START	No.216 - 227
55	Averaging	① Turn "on" STATUS AVG. ② Press COMMAND START	
56	Setting and performing auto sequence	→ Soft key must be set	
57	Performing cancelling function (At the time of hammering)	① Set trigger ② Turn "on" trigger ③ Press COMMAND CANCEL ④ Press COMMAND START ⑤ Press CANCEL when a desired waveform appears ⑥ Press COMMAND PAUSE when an averaging operation is completed by a set number	
58	Plotting with plotter CX-337	① Press COMMAND PAUSE ② Press PLOTTER START	No.228 - 239
59	Stopping plotting operation	Press COMMAND PAUSE	No.131 - 134
60	Storing panel condition	① Set panel conditions ② Press COMMAND PAUSE ③ Press PANEL CONDITION MEMORY STORE ④ Press one of switches 1 to 4 ⑤ Turn "off" STORE	
61	Call a panel condition	① Press COMMAND PAUSE ② Press a memorized switch of PANEL CONDITION MEMORY 1 to 4 (Note: Operate soft key while it represents large items.)	

No.	Function	Operation of panel switch	Refer to SHORT FORM 2
62	Real-time zooming	① Display spectrum ② Shift search marker to a desired point for zooming ③ Press FREQUENCY SET ④ Press FREQUENCY ON ⑤ Set magnification by ☐ or ☐ switch	

SHORT FORM OPERATION 2

Triggering . Averaging

No.	Function	Large item	Small item	Selective item	*	Operation
1	Selecting Ch.A for trigger source	TRIG	SOURCE	Ch A	○	Press TRIGGER REPEAT or SINGLE
2	Selecting Ch.B for trigger source			Ch B		Press TRIGGER REPEAT or SINGLE
3	Selecting an external trigger source			EXT		- " - → Apply a pulse signal through EXT TRIG terminal on the rear panel
4	Trigger slope at leading edge		SLOPE	+	○	Press TRIGGER REPEAT or SINGLE
5	Trigger slope at trailing edge			-		- " -
6	Pre-triggering		POSIT	PRE		- " -
7	Post-triggering			POST	○	- " -
8	Changing a trigger position by shifting search marker			MARKER	○	- " - " → Display a time waveform on the channel selected by No.1 - NO.3 → Change trigger position by ◀ or ▶ search marker
9	Changing a trigger position by unit of frame length			FRM INC	○	Press TRIGGER REPEAT or SINGLE
				FRM DEC		Press TRIGGER REPEAT or SINGLE
10	Changing trigger level		LEVEL	MRK SET		It will change the trigger position Press TRIGGER REPEAT or SINGLE Display a time waveform on the channel selected by No.1 - No.3 → Change the trigger level by ▲ or ▼ search marker
11	Obtaining a normalize average of spectrum	AVERAGE	SPECT	SUM	○	Press AVG. → Set a desired number of averaging by INC or DEC. → Press COMMAND START
12	Obtaining a exponential average of spectrum			EXP		Similar to the above SUM, but the number of averaging is between 2 and 16
13	Peak holding of the spectrum			PEAK		Similar to the above SUM, but the status continues until COMMAND PAUSE is pressed
14	Sweep average			SWEEP		Set a sweep output according to No.86 → Press AVG. → Press COMMAND START
15	Subtraction average of the spectrum			DIFF		Make average an objective sound and BGN by SUM → Turn "off" AVG switch → Switch to DIFF → Press AVG → Set a desired number of average by INC. or DEC. Press COMMAND START
16	Averaging the time waveform		TIME			Similar to the above SPECT, but set a trigger beforehand by No.1 - No.10

Overlapping. Data length. Window.

No.	Function	Large item	Small item	Selec- tive item	*	Operation
17	Setting an overlapping amount to the maximum	MODE	OVLAP	MAX	○	Key in after pressing COMMAND START
18	Setting an overlapping amount to 50%			50%		
19	Setting an overlapping amount to 0%			0%		
20	Setting Ch.A data length to 2K		LENGTH	Ch A 2K		
21	Setting Ch.B data length to 2K			Ch B 2K		
22	Setting 1K (2 Ch.)			DUAL 1K	○	
23	Setting 0.5K (2 Ch.)		WINDOW	DUAL .5K		(Window is automatically switched to from HANN and RECT as trigger is turned "on" and "off".) Set the window beforehand with soft key W SET - " - - " -
24	Rectangular window			RECT		
25	Hanning window			HANN	○	
26	Flat top window			FLAT		
27	Auto window	AUTO				
28	Fourth-fourth window	F.F				
29	Exponential- exponential window	E.E				
30	Fourth-exponential window	F.E				
31	Inputting fourth window factor	W SET	FORCE		Press COMMAND PAUSE → Display a time waveform → Press key → Press SEARCH ON and move marker to the start point on the window → Press Δ SET → Move the marker to the end point on the window → Press SET key	
32	Inputting exponential window factor		EXP		Press COMMAND PAUSE → Display a time waveform → Press key → Input a window factor through numeric key → Press SET key	
			SET		(Note) Display a time waveform in a single siagram	

No.	Function	Large item	Small item	Selective item	*	Operation
33	Providing a delay between Ch.A and Ch.B	MODE	OELAY	INC DEC		Press switches. The number of frames is shown by denotation on the right hand of CRT
34	Avoiding a delay between Ch.A and Ch.B			ZERO		
35	Turning "off" the Spectrum Only Mode			OFF		
36	Turning "on" the Spectrum Only Mode		SP ONLY	ON	○	Press this switch after pressing COMMAND START
37	Selecting analog signals for analysis source		SOURCE	ANALOG	○	
38	Selecting disk (continuous) for analysis source			DISK C.		Press COMMAND PAUSE → (Specify a file number of the disk.) → Press COMMAND START
39	Selecting disk (by file) for analysis source			DISK S.		Similar to the above DISK (CONTINUOUS), but the waveform is displayed file to file
40	Setting disk file No.1			NO.1 SET		Set it only after pressing COMMAND PAUSE
41	Specifying file No.			FILE NO.		Press this switch after pressing COMMAND PAUSE and specify a file No. through numeric keys
42	Setting a number			SET		Set it only after pressing COMMAND PAUSE
43	Turning "off" equalize transfer function	FUNC	EQUALIZE	OFF	○	Press this switch after setting data on equalize memory
44	Turning "on" equalize transfer function			ON		
45	Setting data on equalize memory			SET		
46	Turning "on" four-rule calculation function		CALC	ON		Select +, -, x or / after turning this switch "off"
47	Setting for addition			+	○	Press this key, display a waveform in the same region on a splitted screen and then press No.46 ON
48	Setting for subtraction			-		Press this key, display a waveform in the same region on a splitted screen, and then press No.46 ON
49	Setting for multiplication			x		- " -
50	Setting for division			/		- " -

Time Integral. Frequency Integral and Differential. Octave Analysis. PSD. ESD.

No.	Function	Large item	Small item	Selective item	*	Operation
51	Turning "on" time integral function	FUNC	$\int dt$	ON		
52	Integrating time			$\int dt$	○	
53	Double integral of time			$\int dt^2$		
54	Displaying integral time waveform			DISP		(Note) The integrated result is shown without pressing this switch (Ch.B)
55	Integrating only on Ch.B		jw	SINGLE	○	(Note) Turn this switch "off", and the waveform will be integrated on both channels
56	Turning "on" the frequency integral and differential functions			ON		
57	Frequency differential			x jw	○	
58	Double integral			x (jw) ²		
59	Frequency integral			1/jw		
60	Frequency double integral			1/(jw) ²		
61	Increasing reference gain			REF UP		Press these keys for increasing or reducing the reference gain
62	Reducing reference gain			REF DW		
63	Turning "off" octave analysis			OFF	○	
64	30 band analysis		OCT	30		Press COMMAND PAUSE Press key Press COMMAND START
65	15 band analysis			15		
66	1/3 octave			1/3 OCT	○	
67	1/1 octave		DENSITY	1/1 OCT		
68	Making A waiting valid			A WEIGH		
69	Turning PSD and ESD "off"			OFF	○	
70	Turning "on" power spectrum density			PSD		] Display power spectrum display
71	Turning "on" energy spectrum density			ESD		

Cepstrum. Auto Range. Test Signals. Filter. Sampling Clock

No.	Function	Large item	Small item	Selective item	*	Operation
72	Turning "off" cepstrum	FUNC	CEPSTRM	OFF	○	Display spectrum in a single diagram → Press COMMAND PAUSE → Press key Press these switches for display Press this switch after setting lifter Turn "on" cepstrum → Press SEARCH ON, move marker to start point of the lifter and press ΔSET → Move marker to the end point of the lifter and then press this switch
73	Turning "on" cepstrum			ON		
74	Displaying real cepstrum			REAL	○	
75	Displaying magnitude			MAG		
76	Displaying envelope			ENVELOP		
77	Setting lifter			LIFTER		
78	Turning "on" and "off" buzzer	COND	CONDIT	BUZ ON	○	Press this switch after pressing COMMAND START Apply a TTL level external clock signal through EXT CLK terminal on the rear panel Set an output frequency after pressing the key Display spectrum ① For sine wave output Press SEARCH ON, move marker to a place of desired output frequency and press ΔSET → Press the key ② For sine sweep output Press SEARCH ON, move marker to a place of desired frequency for starting a sweep and ΔSET → Move marker to a place of desired frequency for finishing a sweep → Press the key Perform sweep average (No.14)
79	Turning "on" and "off" auto range			AUTO ON		
80	Turning "on" and "off" test signals			TEST ON		
81	Turning "on" and "off" anti-aliasing filter			FILT ON	○	
82	Selecting internal or external sampling clock			CLK INT	○	
83	Turning "on" and "off" DC cancel function			DC CANC		
84	Turning "on" and "off" A/D overflow cancel function			AD OVR		
85	Outputting sine wave		SIG OUT	SIN		
86	Outputting sine wave sweep			SWEEP		
87	Setting an output frequency			FRQ SET		

Polarity Reversing. Time Record Memory

No.	Function	Large item	Small item	Selective item	*	Operation
88	Turning "off" polarity reversing function	COND	POL CHG	OFF	○	
89	Reversing polarity of Ch.A			Ch A		
90	Reversing polarity of Ch.B			Ch B		
91	Turning "off" spectrum peak search function		S.P SET	OFF	○	
92	Searching spectrum peak with SEARCH ON			ON		
93	Turning "off" impulse mode		IMPULSE	OFF	○	
94	Turning "on" impulse mode			ON		
95	Turning "on" time record function	MAS MEM	RECORD	ON		If you want to store it in memory, press COMMAND START If you want to store it in memory. ① Press COMMAND PAUSE ② Apply a TTL level signal through MASS STORE terminal on the rear panel (Note) In this case, CRT block memory is erased Select a switch Press COMMAND START Address memory between 1 and final point (16,000, 32,000 or 64,000) Select between 1 and 4,096 by pressing these switches
96	Ring mode			RING		
97	Record length to 64K words			64K		
98	Setting Ch.A and Ch.B for record mode		PLYBACK	Ch A & B	○	
99	Setting Ch.A for record mode			Ch A		
100	Setting Ch.B for record mode			Ch B		
101	Erasing time record memory			CLEAR		
102	Reproducing time record			ON		
103	Reproducing time record in the reverse direction			DOWN		
104	Changing memory gap			GAP INC GAP DEC		
105	Setting address of time record memory to zero			ADR CLR		

Control of Channel B Delay. Record Zoom and CRT Memory.

No.	Function	Large item	Small item	Selective item	*	Operation
106	Setting Ch.B delay mode	MAS MEM	PLYBACK	Ch B DLY		Press COMMAND PAUSE → Set a delay point through numeric key
107	Setting delay point			SET		Press the key
108	Setting playback data length to 2,048 points		PB.LENG	2048		
109	" 1,024 points			1024	○	Press these switches after pressing COMMAND PAUSE (512 points are not available for record zoom.)
110	" 512 points			512		
111	Turning "on" record zoom function		PB.ZOOM	ON		Store the waveform in memory → Set a center frequency → Set a magnification rate → Press COMMAND START → Press SINGLE
112	Setting zoom magnification rate			FACTOR		Press COMMAND PAUSE and then press this switch (2 to 16 times)
113	Setting center frequency			CF SET		Press COMMAND PAUSE → Press SEARCH ON and move cursor to a desired center frequency → Press the key
114	Record zooming by one frame			SINGLE		
115	Manual storing of CRT waveform		CRT MEM	MANU	○	Press MEMORY STORE, and a single display will be stored
116	Continuous storing of CRT waveform			AUTO		Press MEMORY STORE, and display will be stored continuously
117	Storing CRT waveform by applying an external timing signal			EXTERNAL		Apply TTL level signal through MASS STORE terminal on the rear panel. A display will be stored every time a signal is applied
118	Changing label and re-storing			L.COPY		Call CRT block memory or waveform in the disk → Change label by No.201
119	Storing time display together with label			TIME ON	○	
120	Inhibiting to write in CRT block memory			PROTECT		
121	Erasing the data of CRT block memory			ALL CLR		

Storing of CRT Waveform and Time Waveform in Disk

No.	Function	Large item	Small item	Selective item	*	Operation
122	Storing CRT waveform in disk	DISK	ST MAS	CRL	○	Display waveform → (Specify memory No. using MEMORY ADDRESS) → Press MEMORY STORE
123	Storing CRT waveform continuously in disk			AUTO		The same as above
124	Storing CRT block memory waveform in disk			MASS		Display waveform → (Specify a desired address No.) → Press START
125	Storing all CRT block memory waveform in disk			MAS ALL		The same as above
126	Specifying a desired address No. on the disk for storing			FILE NO. SET		Press COMMAND PAUSE → Input an address No. through numeric keys → Press this switch
127	Starting to store			START		
128	Storing time record in disk		ST TIME	TIME	○	Store the waveform by No.95 and thereafter → (Specify an address No.) → Press START
129	Specifying a desired address No. on the disk for storing.			FILE NO. SET		Press COMMAND PAUSE → Input an address No. through numeric keys → Press this switch
130	Starting to store		ST COND	START		
131	Storing panel conditions in disk			P.COND	○	Store a panel condition → (Specify an address No. of the disk to store) → Press START
132	Storing auto sequence in disk			SEQUENC		Make a program by auto sequence No. (Specify an address No. of the disk to store.) → Press START
133	Specifying an address No. for storing			FILE NO. SET		Press COMMAND PAUSE → Input an address No. through numeric keys → Press this switch
134	Starting to store			START		

Reproduction of Disk Data. Specifying Drive. Copy format

No.	Function	Large item	Small item	Selec- tive item	*	Operation
135	Calling a file of waveform from disk	DISK	LD MAS	MASS	○	Specify a file to call → Press START → (Press CRT BLOCK MEMORY RECALL)
136	Calling 30 files of waveform from disk			MAS ALL		Specify the files to call → Press START → (Press CRT BLOCK MEMORY RECALL)
137	Listing up the contents of disk			LIST UP		Press COMMAND PAUSE → Press key → (Specify the files) → Press START
138	Setting file No. to "1"			NO.1 SET		Press this key after pressing COMMAND PAUSE
139	Specifying the file No.			FILE NO.		Press COMMAND PAUSE → Input file No. through numeric key ↴
140	Starting to call		LD MAS	SET		Press the key
141	Calling time waveform stored in the disk on to the time record memory		LD TIME	START	○	Specify the file to call → Press START (→ Go to No.102)
142	Specifying file No.			FILE NO. SET		Press COMMAND PAUSE → Input the file No. through numeric keys Press the key ↴
143	Starting to call			START	○	Press COMMAND PAUSE → Specify the file No. to call → Press START (→ Operate PANEL CONDITION MEMORY)
144	Calling a panel condition stored in the disk		LD COND	P.COND		The same as P.COND (Go to No.146)
145	Calling auto sequence program stored in the disk			SEQUENC		
146	Specifying the file No.			FILE NO. SET		Press COMMAND PAUSE → Input the file No. through numeric keys Press the key ↴
147	Starting to call			START	○	
148	Using a housed disk for drive		UTILITY	DRIVE 0		Press these switches after pressing COMMAND PAUSE
149	Using CF-905 No.1 for drive			DRIVE 1		
150	Using CF-905 No.2 for drive			DRIVE 2		
151	Purging a specified file			PURGE		Specify a file to purge → Press COMMAND PAUSE → Press START
152	Copying the disk from drive 0 to 1 or to 2			COPY		Set a source disk at drive 0 → Set a target at drive 1 or 2 → Press No.149 or 150 → Press key → Press START
153	Formatting			FORMAT		Set a blank disk at drive 0 → Press COMMAND PAUSE → Press START
154	Starting utility			START		

Changing of Format on Display. 3-Array Display. Listing Function. Coherent Blanking.

No.	Function	Large item	Small item	Selective item	*	Operation
155	Splitting display	DISPLAY	FORMAT	SPLIT	○	Press this switch after displaying a waveform in the same region both on the upper and lower portion of CRT
156	Overlaying display			OVERLAY		
157	Grid display			GRID ON		
158	Displaying in Bode diagram			BODE ON		Press this switch after separately displaying gain on the lower portion and phase a transfer function on the upper portion of a screen
159	Magnifying by 100 times the amplitude of spectrum			CRS x100		Press this switch after displaying a cross spectrum
160	Reducing spectrum gain by 40 dB			dB GAIN		
161	Turning "off" listing function	LIST	LIST	OFF	○	Press LIST
162	Turning "on" listing function			ON		
163	Setting data for listing			SET		
164	Moving set cursor			INC DEC		The cursor moves vertically when these switches are depressed
165	Clearing the data on display			CLR		
166	Turning "on" and "off" peak list			PEAK		Move cursor to the data No. to be cleared and press this switch
167	Turning "on" and "off" 3-array scroll	3-ARRAY	3-ARRAY	SCROLL	○	(Do this with 3-array display)
168	Waterfall 3-array display			DOWN	○	Press these switches (With 3-array display)
169	Invert waterfall 3-array display			UP		
170	Changing 3-array angles			degree		Press this switch for changing the angles (with 3-array display)
171	Changing Y-coordinates gain of 3-array display			HIGHT 1 HIGHT 2 HIGHT 3	○	Press these switches as required (with 3-array display)
172	Turning "off" coherent blanking			COH BLK	○	
173	Turning "on" coherent blanking			ON		Press COMMAND PAUSE → Press this key → Press COMMAND START
174	Setting a blanking level			SET		Display coherent function and do No.173 → Set a level operating search marker  or  → Press the key

Alternation of 1/H Transfer Function. Partial Overall. Display Inhibit Function and Unit.

No.	Function	Large item	Small item	Selective item	*	Operation
175	Changing the transfer function reference	DISPLAY	XFER	REF	○	} Press these switch to select
176	Changing transfer function gain			GAIN		
177	Increasing reference gain			UP	}	} Press one of these two switches
178	Reducing reference gain			DOWN		
179	Inversing transfer function			1/H		
180	Turning "on" and "off" partial overall		P.OV	ON		Press SEARCH ON and move marker to the start point → Press Δ SET → Move the marker to the end point → Press the key
181	Turning "on" display inhibit function		INHIBIT	ON		(Note) When inhibiting averaging display alone
182	Inhibiting all displays			ALL F.		When inhibiting all displays
183	Allowing to display average once every two times			1/2		When displaying average once every two times
184	Displaying X-coordinates in CPM	UNIT	UNIT X	CPM	○	Press X UNIT switch with CRT displaying spectrum
185	Displaying X-coordinates in ORD			ORDER		Display spectrum Press SEARCH ON and move the search marker to a desired place for linear indication (ORDER SET) →
186	Setting a linear component			ORD SET		Press this switch Turn X UNIT "on"
187	Scrolling a list while a splitted display consists of a list and a spectrum diagram			LIST UP LIST DW	}	} Press these switches for scrolling a list up and down
188	Letting the marker follow the order of component shown on ORD display			FIT		
189	Displaying Y-coordinates in effective value		UNITY	Vrms	○	Press Y UNIT ON Display spectrum
190	Displaying Y-coordinates in EU			EU		Press Y UNIT ON Set EU by No.

Setting of EU and View Display

No.	Function	Large item	Small item	Selective item	*	Operation
191	Specifying the size of EU for 1 V	UNIT	Ch A EU	EU/V	○	Do No.196 → Input EU size Press SET key
192	Specifying a voltage for 1 EU			V/EU		Do No.196 → Input a voltage → Press SET key
193	Letting search point agree with 1 EU			S.P/EU		Press SEARCH ON and move marker to a point on spectrum etc., at which you want to have 1 EU → Do No.196 → Press SET key
194	Setting the search point at an arbitrary dB value			dB/S.P		Press SEARCH ON and move marker to an arbitrary point on spectrum (or O.A) → Do No.196 → Input a desired dB value → Press SET key
195	Replacing EU by arbitrary characters			EU=		Do No.196 → Input desired characters → Press SET key
196	Making EU on Ch.A to SET MODE			SET Ch A		Display waveform on Ch.A → Press COMMAND PAUSE → Press this key
197	Setting		Ch B EU	SET	○	} Similar to No.196 (but with a display of waveform on Ch.B.)
198	Making EU on Ch.B to SET MODE			EU/V		
				V/EU		
				S.P/EU		
				dB/S.P		
				EU=		
				SET Ch B		
				SET		
199	Turning "off" View Mode	VIEW	VIEW	OFF	○	} Press these switches
200	Displaying View No.1 to View No.6			VIEW 1		
				VIEW 6		

Label Function. Setup View. Timer. Interval.

No.	Function	Large item	Small item	Selective item	*	Operation
201	Turning "on" and "off" label	VIEW	LABEL	ON	○	Press COMMAND PAUSE → Move cursor by search marker  or  → Input arbitrary characters
202	Turning "on" and "off" label change mode			TEXT ON		
203	Large character input mode			LARGE	○	Press this switch, and the characters inputted will become large characters
204	Small character input mode			SMALL		Press this switch, and the characters inputted will become small characters
205	Turning "on" insert function			INSERT		Press this switch, and a character inputted will be inserted in between
206	Deleting characters			DELETE		Press this key, and a character pointed by the cursor and those following thereto will be deleted one by one
207	Clearing a character line			CLR		Press this key, and all the characters following one pointed by the cursor will be cleared
208	Turning "on" and "off" setup view		SETUP	ON		Press COMMAND PAUSE → Press this key
209	Renewing setup view			INC DEC		} Press these keys, and setup views will be displayed one after another
210	Turning "on" and "off" timer set mode	TIMER	TIM SET	ON		Press this key after pressing COMMAND PAUSE
211				SET		Press this key after inputting a set time through the numeric keys
212	Setting timer to zero			00:00		Input a time in two digits for hour and two digits for minutes (00 hours 00 minutes)
213	Moving set cursor					Press this key to move cursor to the left Press this key to move cursor to the right
214	Turning "on" interval function		INTERVAL	INT ON		
215	Setting an interval time			SET ON SET		Press COMMAND PAUSE → Press the key → Input a value through numeric keys Press the key ←

Auto Sequence

No.	Function	Large item	Small item	Selective item	*	Operation
216	Setting for sequence mode	SEQUENC	SEQ SET	ON		Select No.217 or No.218 → Press the key → Press COMMAND PAUSE → Press AUTO SEQUENCE → → Perform steps for programming (Press No.219) → Press AUTO SEQUENCE
217	Selecting sequence memory No.1			SEQ 1	○	} Press either of them
218	Selecting sequence memory No.2			SEQ 2		
219	Providing an interval between steps			DLY MRK		Press this key between steps while executing a program, and it will provide an interval (Note: Leave No.214 "on")
220	Turning "off" auto sequence		SEQ RUN	OFF	○	Press this key to turn off the sequence
221	Manual execution of sequence step to step			STEP		Press AUTO SEQUENCE, and sequence will be executed step to step
222	Continuous execution throughout entire steps			AUTO		Press AUTO SEQUENCE, and it will allow continuous execution throughout the entire steps
223	Selecting sequence memory No.1			SEQ 1	○	} Press either of them (Check No.227) (Check No.214)
224	Selecting sequence memory No.2			SEQ 2		
225	Ring mode			RING		
226	Providing an interval between steps			TI CONT		After selecting either SEQ 1 or SEQ 2, Press No.221 or No.222 → Press AUTO SEQUENCE, and sequence will start
227	Setting a number of repetitions of ring mode		MUM SET	ON SET		Press COMMAND PAUSE → Press the key → Input a value through the numeric key Press the key ←

Plotter Control

No.	Function	Large item	Small item	Selective item	*	Operation
228	When CX-337 (8 parallel) is used	PLOTTER	DEVICE	PLOT 1	○	CX-337, WX-4636 (GRAPHTEC)
229	When HP-GL plotter is used			PLOT 2		HP-9872C/T, 7470A, 7475A, etc. Bit switch of GP-IB on the rear panel must be set to talk only position
230	When CX-337 (GP-IB) is used			PLOT 3		GP-IB version of CX-337 and WX-4636
231				EXPAND		
232	Plotting waveform with Pen 1		DATA	PEN 1	○	Select by pressing one of these keys
	Plotting waveform with Pen 4			PEN 4		
	Not plotting waveforms			OFF		
233	Plotting frame with Pen 1		FRAME	PEN 1	○	Select by pressing one of these keys
	Plotting frame with Pen 4			PEN 4		
	Not plotting frames			OFF		
234	Plotting grids in continuous line		CHARACT	GRD LIN		
235	Plotting annotation with Pen 1			PEN 1		Select by pressing one of these keys
	Plotting annotation with Pen 4			PEN 4		
	Not plotting annotation			OFF		
236	Plotting "on" and "off" with soft key		FEED	SOFT KY	○	
237	Plotting search data annotation alone			SERCH		
238	Normal paper feed			1/1 FEED	○	Select by pressing one of these keys. But this operation is not valid if the connected plotter does not have a paper feed mechanism
	Feeding paper by 1/32			1/32		
239	Not feeding paper			OFF		

Plotter Control. Auto Plot. Disk in Three Dimensions. Plot Location

No.	Function	Large item	Small item	Selec- tive item	*	Operation
240	Plotting CRT	PLOTTER	SOURCE	CRT	○	} Press this key → Press COMMAND PAUSE → Press PLOTTER START
241	Plotting data in CRT block memory			MASS		
242	Plotting data on disk (Auto plotting)			DISK		
243	Plotter trace function			TRACE		
244	Setting disk for three-dimensions and spectrum line			DISK 3D ARRAYN		
245	Setting format 1		FORMAT	FORMAT 1	○	(A4)
	Setting format 2			FORMAT 2		(A6)
	Setting format 3			FORMAT 3		(A5)
	Setting plot location 1			LOCAT 1	○	
	Setting plot location 2			LOCAT 2		
	Setting plot location 3			LOCAT 3		
	Setting plot location 4			LOCAT 4		

CHAPTER 4

FUNCTIONAL CHECK AND CALIBRATION

1. Simple Check by Test Signals
2. Calibration for Sensors
3. Calibration for Sound-Level Meters

Simple Check by Test Signals

[Simple Functional Check By Internal Test Signals]

1. Reset the system and press key.
2. Press key.
3. Press and and set both Ch.A and Ch.B to DC coupling.
 - * These procedures will cause the attenuator to stay in auto range and CRT will display the test signals.
(Fig.1)
4. Let power spectrum appear on the CRT by pressing SPECT A, SECOND and SPECT B, in this order. (Fig.2)
 - * This will allow a maximum value to appear on Y-coordinates because SEARCH is kept in "off" position.

CRITERIA

- a The correct values must be shown on the X-coordinates in each frequency range as specified in Table 1.
- b The values on the Y-coordinates must be within -7.0 ± 0.2 dB.

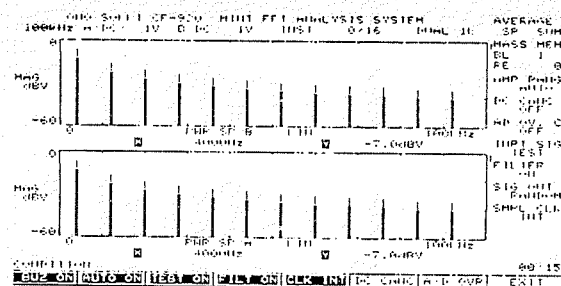
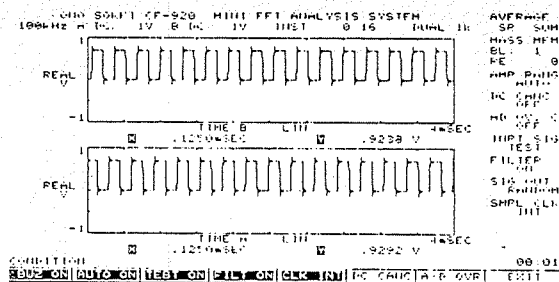


Table 1

Frequency range (Hz)	X-coordinates value (Hz)	Frequency range (Hz)	X-coordinates value (Hz)
100k	4000	200	8
50k	2000	100	4.0
40k	1600	50	2.0
20k	800	20	0.8
10k	400	10	0.4
5k	200	5	0.2
2k	80	2	0.08
1k	40	1	0.04
500	20		

Calibration for the Sensors

Calibration for ONO's Vibration sensor (Acceleration sensor, NP-500 Series)

- ① Check the Characteristic Table attached to each sensor on its output voltage.

(The average values of each model are shown below, although each sensors has its own value.)

Model No.	NP-501F	NP-501S	NP-510	NP-510 I	NP-520	NP-520I	NP-505	NP-550	NP-560
Sensi- tivity	0.7mV/G ±1 dB	10mV/G ±1 dB	10mV/G ±1 dB	10mV/G ±1 dB	100mV/G ±1 dB	100mV/G ±1 dB	10mV/G ±1 dB	10mV/G ±1 dB	35mV/G ±1 dB

- ② Before calibrating the output of a sensor (NP-510S, for example) on this Analyzer, you must obtain an input value from the following calculation;

When we take A for sensor's sensitivity and N for an input value,

$$\begin{aligned} 1g &= 9800 \text{ mm/sec}^2 = A[V] = 10 \text{ mV} \\ &= 0.01 \text{ V} \end{aligned}$$

$$1 \text{ mm/sec}^2 = 0.01/9800 = 1.02 \times 10^{-6} \text{ (V)}$$

However, you must divide an obtained value into an exponential part and a fixed point part for inputting to Analyzer CF-900;

$$N = 0.1020E - 5 \text{ (V/EU)}$$

- ③ Then, operate the soft key in the following order;
 - UNIT → UNIT Y → EU → EXIT
 - V/EU → SET Ch A(B)

And, input ".1020E-5" through the numeric keys.

- Press SET key.

④ Turn "on" Y UNIT.

Now, the sensor output is ready to show in a form of "XXEU",
in other words, a direct reading value " XXg".

In order to let the analyzer indicate the value in the unit
of mm/sec or mm/min;

o Operate the soft keys as under;

A FUNC → 1/jw → and turn "on" : 1EU = 1 mm/sec

B FUNC → (1/jw)² → and turn "on" : 1EU = 1 mm

The calibration values, N, obtained by the above-mentioned
method are listed below;

Model No.	NP-501F	NP-501S	NP-510	NP-510I	NP-520	NP-520I	NP-505	NP-550	NP-560
N	.0714E - 6	.1020E - 5	.1020E - 5	.1020E - 5	.1020E - 4	.1020E - 4	.1020E - 5	.1020E - 4	.3571E - 5

Calibration for Sound-Level Meter

Calibration using CAL signal

- ① Set a sound-level meter to CAL range.
- ② Set the needle of the sound-level meter to its CAL level and apply its output to CF-900.
- ③ Set the frequency range of CF-900 to 20 KHz or higher and increase its sensitivity as high as possible but not to cause overflowing.
- ④ Let spectrum display on Ch.A or Ch.B, depending on the input signal connection, and set the search marker at O.A point.
- ⑤ Press the soft keys in the following order (with COMMAND PAUSE);
 1. UNIT → UNIT Y → EU → EXIT
 2. Ch.A(B) EU → dB/S.P → SET Ch.A(B)
 3. Input a reading value of CAL signal of the sound-level meter to CF-900 through the numeric keys.
For example, "+005" for 5 dB.
 4. Press keys, SET → EU → SET Ch.A(A)
 5. Clear EU by pressing, (space) on the panel.
 6. Press SET key.
 7. Turn "on" UNIT Y panel key.

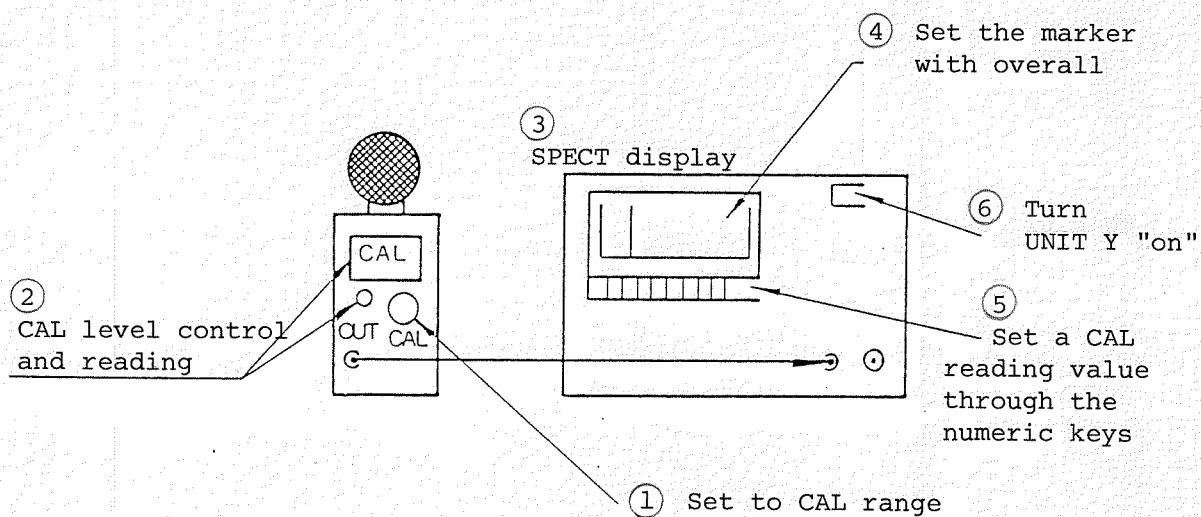
Now, O.A value of the spectrum has become equal to the reading value of the sound-level meter.

An actual reading value is obtained in the following way;

A	B	C
Meter range	Value of spectrum searched	Actual value
70 dB	5 dB	75 dB
80 dB	-20 dB	60 dB
90 dB	0 dB	90 dB
:	:	:

(Note : B is a value of O.A)

Hence, $C = A + B$



CHAPTER 5

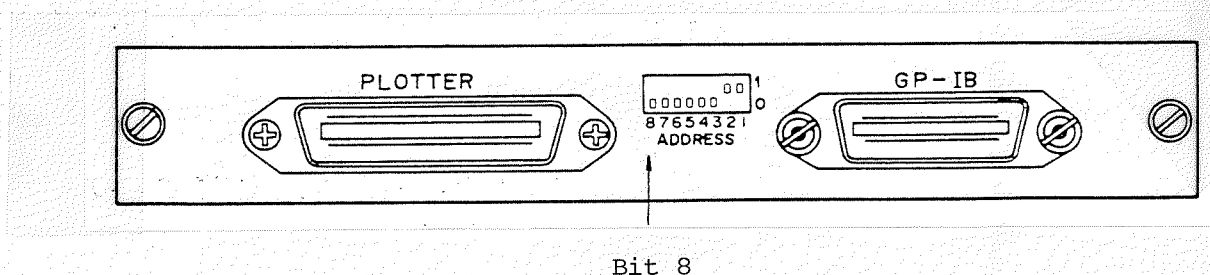
CONNECTION OF X-Y PLOTTER

1. Connection of GP-1B type X-Y plotter
2. Connection of CX-337 and troubleshooting

Connection of GP-IB Type X-Y Plotter

Connect a GP-IB type X-Y plotter to the analyzer in the following way;

- ① Set the X-Y plotter to the state of "LISTEN ONLY" according to the Operation Manual attached to the plotter.
- ② Turn "on"(1) position 8 of GP-IB address switch located on the rear panel of the analyzer for resetting the system before supplying the power source. Now the analyzer's GP-IB interface has become "TALK ONLY" state.



Rear panel of FFT Analyzer

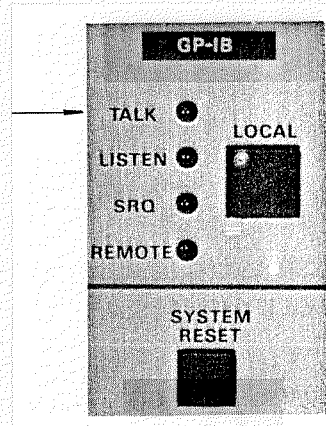
- ③ Press the soft keys as under;

PH-GL type X-Y plotter	GP-IB type CX-337, WX-4636	
① PLOTTER	PLOTTER	↓
② DEVICE	DEVICE	
③ PLOT 2	PLOT 3	

- ④ Display waveform and press START switch on the plotter.

(Caution) When the analyzer is in the state of "TALK ONLY", an LED of "TALK" on GP-IB indicator will light up.

This LED will light up.



Connection CX-337

Connecting a CX-337 to Analyzer CF-900 Series

Connect a CX-337 plotter firmly to CX-337 analyzer using AX-303 cable. The cable connector must be securely fastened to the receptacle on CX-337 plotter with the fastening screws.

Troubleshooting

In you find that your plotter CX-337 connected to CF-900 Series FFT Analyzer shows failures in operation as listed below, check your system.

1. Does not work at all.
2. Error lamp on the operation panel of CX-337 lights up.
3. Plotting location shifts away.
4. Does not feed the paper.
5. Plots repeatedly in the same position.

Troubleshooting methods for 1 to 3 will be mentioned later.

For 4 and 5;

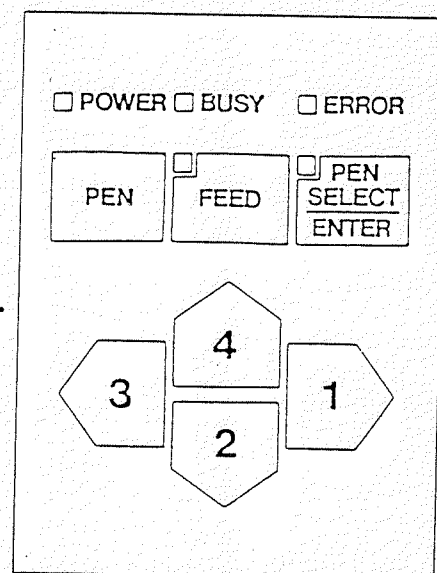
⇒ Check that AUTO FEED on the soft key has been turned "on".

Check CX-337 by its self-checking function according to
"Self-test 1";

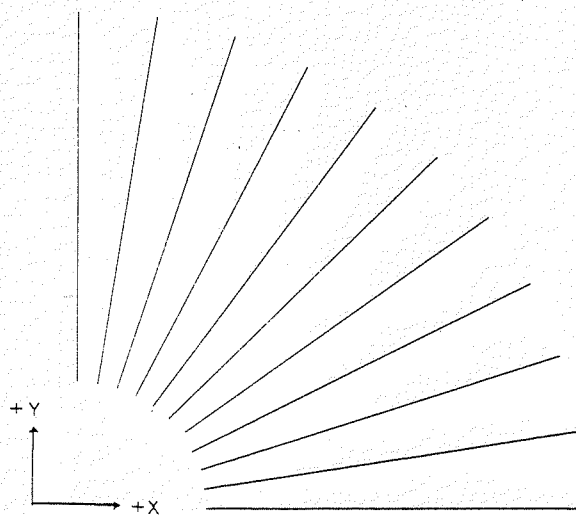
Self-test 1

(1)-1 Turn "off" power switch.

(1)-2 Turn "on" power switch as
you are pressing switch 3 in
the illustration on the right.
If you find it normal in
operation, let it draw the
test lines as shown below;



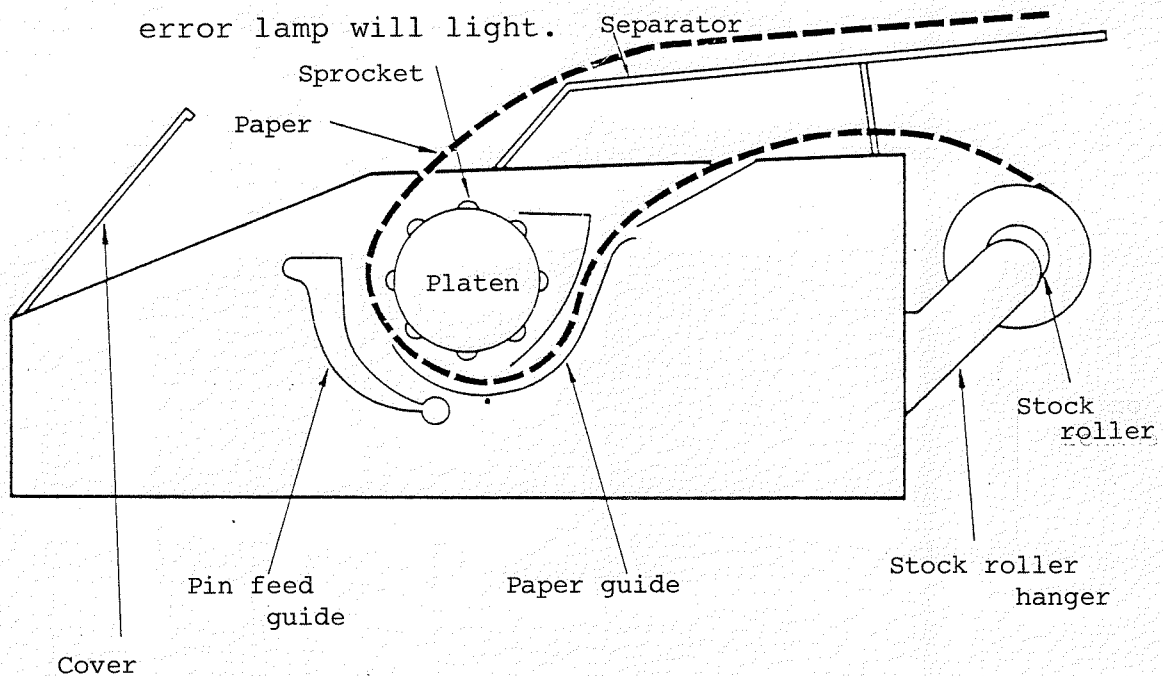
** TEST OF PLOTTER **



When all the lines are drawn correctly, go to Test (2).
If not, go to (1)-3.

(1)-3 Since a cause of trouble exists in CX-337, check the following points;

- ① Check to see if the record paper is correctly threaded. The plotter must be threaded as shown below. If not, error lamp will light.



(1)-4 After the plotter has been correctly threaded, check again from (1)-1.

Matching with CF-900

(2)-1 When the function of the plotter has been proved normal, connect it to the Analyzer CF-900.

Ensure that the cable is firmly connected at both ends.

(2)-2 If the plotter does not work correctly, let the interface do self-check.

- ① Disconnect the cable from Analyzer CF-900.
- ② Press COMMAND PAUSE of the analyzer and then press PLOTTER START switch.

③ If the interface is normal, PLOTTER START lamp will light and, a little later, PLOTTER STOP lamp will light, too. And, the analyzer is ready to perform an analyzing operation.

④ Now, the analyzer CF-900 has been proved to be normal.

(2)-3 If the above tests do not solve the problem, check the cable and connectors for breakage or disconnection.